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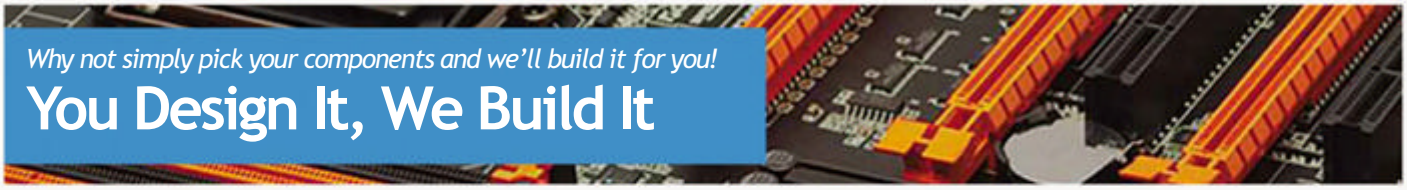

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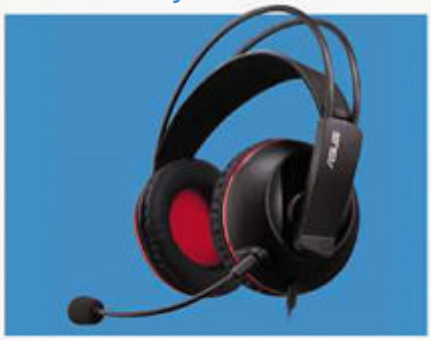

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08 Facebook Secrets

The world's most popular social network is awash with photos of people's pets, people's food and people's kids – and Facebook is more than happy for that to be the case. That's because, the more you share, the more more money it makes. It doesn't want you to think too much about that bit, though – just like it doesn't want you to think about all the other things it keeps hidden in plain sight

18 Recover Deleted Files

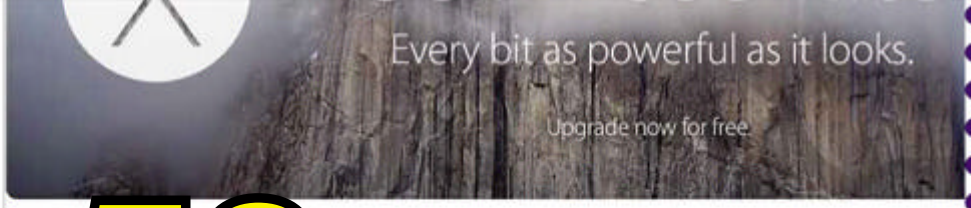
We've all heard the expression that nothing is ever deleted on a computer and, to an extent, that's true. Creepy as that might sound, it can also be an extremely useful fact, particularly if you've accidentally erased a file and you urgently need it back. Aaron Birch imparts some advice on what to do to get those files back, as well as how to ensure that once something's gone, it's gone for good

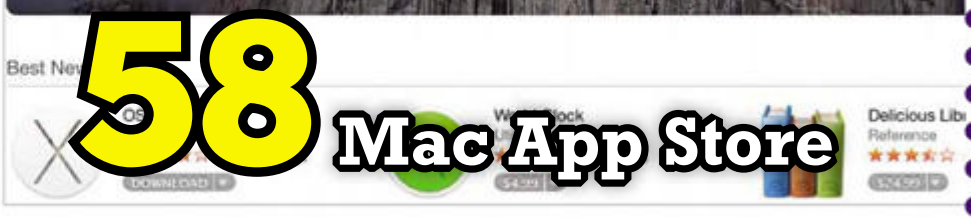
24 Microsoft Band

No, Bill Gates and Steve Ballmer aren't getting their guitars out and embarking on a worldwide tour (not that we know of, anyway). The Microsoft Band is the company's entry into the rapidly growing wearables market, and David Briddock has been looking at what it has to offer. Can it succeed where many others have so far failed?

46 Touchscreen Laptops

In spite of their tendency to attract fingerprints, the touchscreen laptop is here to stay. They may be a little awkward to use, but sometimes they really can be a revelation. Which is the one for you, though? We've got six of them in this week's issue, and we've been putting them to the test





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56 Replace Your GPU Cooler

When it comes to replacing coolers in PCs, it's usually the processor fan that gets changed. However, you can also change the cooler on your graphics card, which is ideal if you fancy overclocking it a bit. It's not quite as straightforward, but it's certainly doable, as James Hunt explains

58 Mac App Store

Apple may not have invented the app store concept, but it can definitely be credited for making it popular. Oddly, though, its app store for the Mac hasn't really taken off like you might think. Keir Thomas considers why this might be and looks at what's available in the store

62 Should You Fear Security Breaches?

So many huge companies have been hacked and had customer information stolen that it's a surprise we aren't all just crawled up in the foetal position under our duvets, waiting for the sky to fall in. At least it seems that way. Maybe, though, things aren't as bad as they seem and security has been tightened up across the board. Sarah Dobbs takes a look

64 Happy Birthday Zzap!64

In spite of his healthy glowing skin and cat-like reflexes, David Hayward is not actually as young as he thinks he is. That's why he remembers (just about) a certain computer games magazine called *Zzap!64*, which launched 30 years ago, in May 1985, and ran for a good seven years. Join us as we wish it happy birthday

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13 Things facebook Would Rather You Didn't Think About

What's on your mind? Maybe it's the latest meme you've discovered or a piece of news you would love to share. But perhaps it's what is on Facebook's mind that really matters, as David Crookes explains

Facebook has 1.39 billion users, around five times the number of people using Twitter. It is the most successful social network in the world, an essential go-to each day for the latest happenings in your friends' circles. It lets you catch up with people who may have otherwise drifted, and it allows you to become aware of news you could so easily have missed. It introduces you to perfect family lives, gives you inspiration via lots of shared peppy quotes, and it can make you laugh and cry in equal measure.

But there is an argument that Facebook isn't always quite what it seems. Facebook may want to present itself as the perfect way to hook up with friends and family, but the company is interested in far more than facilitating your online social life. The bottom line is that the company needs to make money to thrive, and there's no doubting that it's successful when it comes to revenue generation.

Here we look at how Facebook achieves its goals and at how it keeps you coming back for more. Some of these points are clearly stated in the social network's readily available terms and conditions, but others have emerged in news reports or have been gleaned through simple observations. In the majority of cases, though, the points are generally glossed over and ignored as people get on with their interactions, and certainly Facebook is not overly keen to bring attention to them.

Facebook Knows What You Use... And Where You Are

When you log on to Facebook, it collects information about your device including the operating system it uses, the hardware it's running on and its settings. It also looks for the file and software name and types, the battery and signal strength and other device identifiers. And it says it does this in order to "provide consistent Services across your devices".

That may be so, but in addition to this, Facebook learns the name of your mobile operator or internet service provider. It gets to know the browser you use, your mobile phone number, your IP address, your language and your time zone. Facebook will also gather your location. It can do this through GPS, Bluetooth and wi-fi signals, and it says it is necessary for certain features such as checking in, finding local events and seeking nearby offers.

It seems like a lot of data is being swapped in exchange for you being able to post a photo of yourself on your holidays. But Facebook does allow you to opt out. What the company is able to derive from your sessions is dependent on your permissions – so head for the privacy settings and pay around to make sure you're not giving too much away.

Facebook Decides What You See

You may think that your Facebook news feed is jam-packed with every post created by those in your Friends' list, but that is not the case. Facebook uses an algorithm to filter the status updates and page posts that you see, based on how often you interact with certain people or organisations.

To be fair, the company is entirely open about doing this: Lars Backstrom blogged about on Facebook's business pages in 2013. What it means is that the less you interact with individual posts by liking, sharing or commenting, the fewer of them you will see until they end up dropping off your timeline completely. Likewise, the more you interact with a person's posts, the greater the chance you will see more.

It makes common sense, of course. It could well be that all your friends are active on Facebook, in which case you could become overwhelmed by a sheer number of posts which would take much of your day to get through. But it can also cause some problems, forcing to you lose touch with certain individuals.

The answer is to seize some control. You can change the way Facebook presents updates by organising them in the order they were posted rather than as Top Stories, but bear in mind that after a certain period, the feed reverts back. You can also manually search for a friend and engage with a Like or comment. In doing so, that person's posts will start to work their through the filter and you will see more of them.

"Facebook is able to link a social advert with your photo"

At the same time, there will be people on Facebook who you want to remain friends with but who tend to post uninteresting items. Just ignoring them will lead them to fall away, but if this isn't working the way you like, then you can click the downward arrow next to a post and select "I don't want to see this".

The algorithm picks up on your choice, reducing the likelihood of the post appearing on your feeds. But it affects other people's feeds too, since the network, by its nature, lumps people into groups, so the more folk who block someone's post, the less likely they will appear on anyone's feeds. Conversely, posts that are popular among many people in your network are more likely to work their way to the top of what you see.

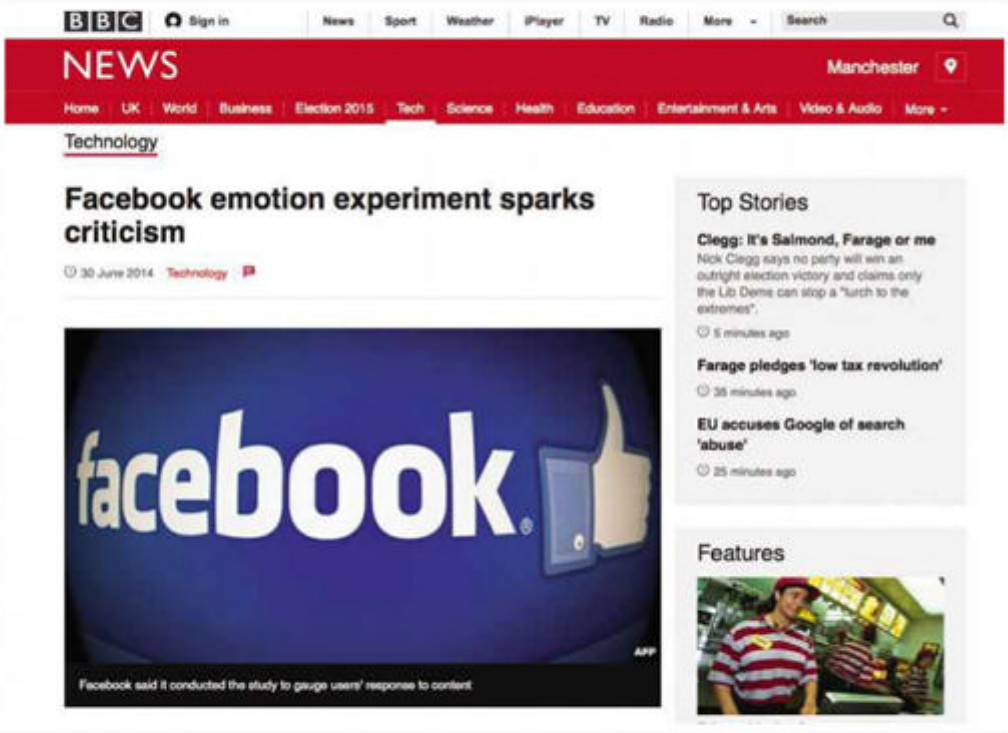
Facebook Experiments With You

Not only does Facebook insist on filtering the posts you see, it has been conducting experiments to work out if it can manipulate the way you feel. In 2014, it emerged that Facebook had conducted a mood experiment on 689,003 news feeds two years earlier by secretly hiding what it said was a small percentage of emotional words from news feeds.

Facebook was hoping to discover how certain emotions could affect the way people interacted with a status. It found that those who saw fewer positive posts on their news feed tended to post more negative status updates. People who saw more positive posts became happier in their own interactions.

The research was published in the Proceedings of the National Academy of Sciences in the United States and Facebook said the findings had allowed it "to improve our services and to make the content people see on Facebook as relevant and engaging as possible." But the experiment was widely slammed. Facebook was accused of emotionally manipulating users, and some critics said the move, if left unchecked, could lead to a level of "thought-control".

Yet Facebook users gave the social network permission to conduct these experiments. How? In the terms and conditions that Facebook users sign up to, there is a clause allowing the social media giant to use personal information for research, and it doesn't matter if people do not read the T&Cs before they agree: the scientists headed up by Adam Kramer were given informed consent for the study. That didn't stop an official complaint being filed by the digital rights group, the Electronic Privacy Information Center, though. It said that Facebook had flouted ethical standards that govern experiments on human subjects.



Facebook Exists To Sell Adverts

One of the reasons many believe the experiment took place was to allow Facebook to better promote the businesses that advertise on the network. Facebook makes its money from allowing other companies to

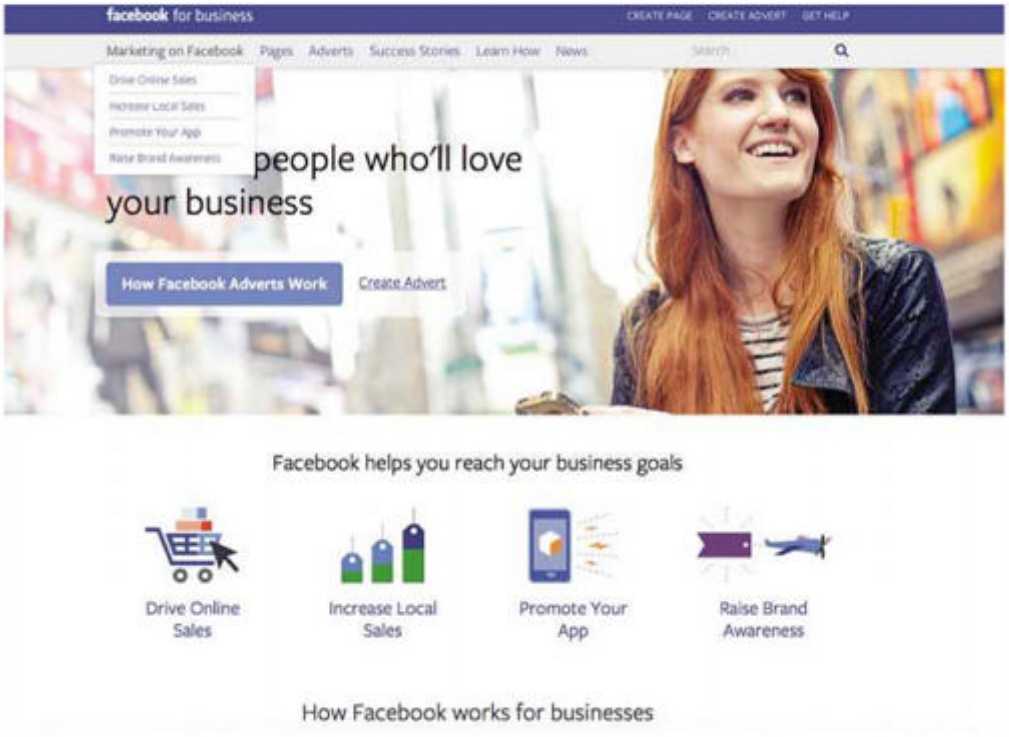
plug their products or services, so it's vital that it becomes ever more efficient. By looking at how well people respond to certain words, there is every chance that an advertiser's message can be made more effective. Perhaps advertisers will one day target their products according to a person's current state-of-mind.

Currently, though, the most obvious way that Facebook targets users is via Promoted Posts. Although companies are able to create a Page on Facebook for free, Facebook's algorithms ensure firms have to hit the right spot in order to get noticed (too many blocks and not enough Likes will destroy a social campaign). A Promoted Post makes life easier. Companies pay for their exposure, and they get to take advantage of all the data you input into the site. It makes for better customer targeting, and it's why if you're single you can be encouraged to sign up to dating websites, and why if you profess to love films you can be hit with movie-related promos.

Promoted Posts are a huge success and they have helped Facebook to become a very lucrative business. Time.com reported that Facebook can make as much as $2.8 billion a quarter from users' personal information (Facebook doesn't sell your information, but it will share non-personally identifiable info that is useful for advertising campaigns). But we can put up with it because, without advertising, there would be no Facebook. It has to make its money somehow, especially if it is to remain free.

Even so, you can have some control over what adverts you do and don't want to see by tapping the drop-down menu next to a Promoted Post. Most interesting is an entry called "Why am I seeing this?". It tells you exactly why you have been targeted with a specific advert, and it serves to show how your data is being used.

For example, we decided to check out the reason why we were earmarked as a potential customer of Motivational Press, a company looking for manuscripts from budding authors. We were told it was because the advertiser wanted to "reach people aged 30 and older in the United Kingdom with the job title Journalist listed on their Profile".



"Never before have so many people willingly given away so much about themselves"

It went on to explain that Facebook is always able to use information about your age, gender, location and the devices you use to access Facebook when deciding which adverts to show you." All of this can feel rather unnerving, which is why you should check out our boxout, which explains how you can alter your overall Advert Preferences to determine the way Facebook is able to use your data in the future.

Facebook Can Use Your Photos In Adverts

Facebook also has social adverts. You may have seen brands popping up on news feeds with a line that states so-and-so likes a particular company. The idea is that someone you know is effectively endorsing the firm, and this increases the likelihood that you will engage with it.

Facebook is able to link a social advert with your photo and the fact you like a company's page because, by using the service, you agree to its Statement of Rights and Responsibilities. This specifically states, "You give us permission to use your name, profile picture, content and information in connection with commercial, sponsored or related content (such as a brand you like) served or enhanced by us. This means, for example, that you permit a business or other entity to pay us to display your name and/or profile picture with your content or information, without any compensation to you. If you have selected a specific audience for your content or information, we will respect your choice when we use it."

It is possible to deactivate this by going into the Settings. Find the Privacy > Ads section and look at the permissions for Third-party Sites, and Ads and Friends. Facebook says it does not sell your information to advertisers and that your privacy settings apply to social ads. It also says only confirmed friends are able to see your actions alongside an advert. But change the permissions to 'No One' if you would prefer to opt out of the entire advertising initiative.

There is a third part to this called Ads Based on Your Use of Websites or Apps Outside of Facebook. It allows

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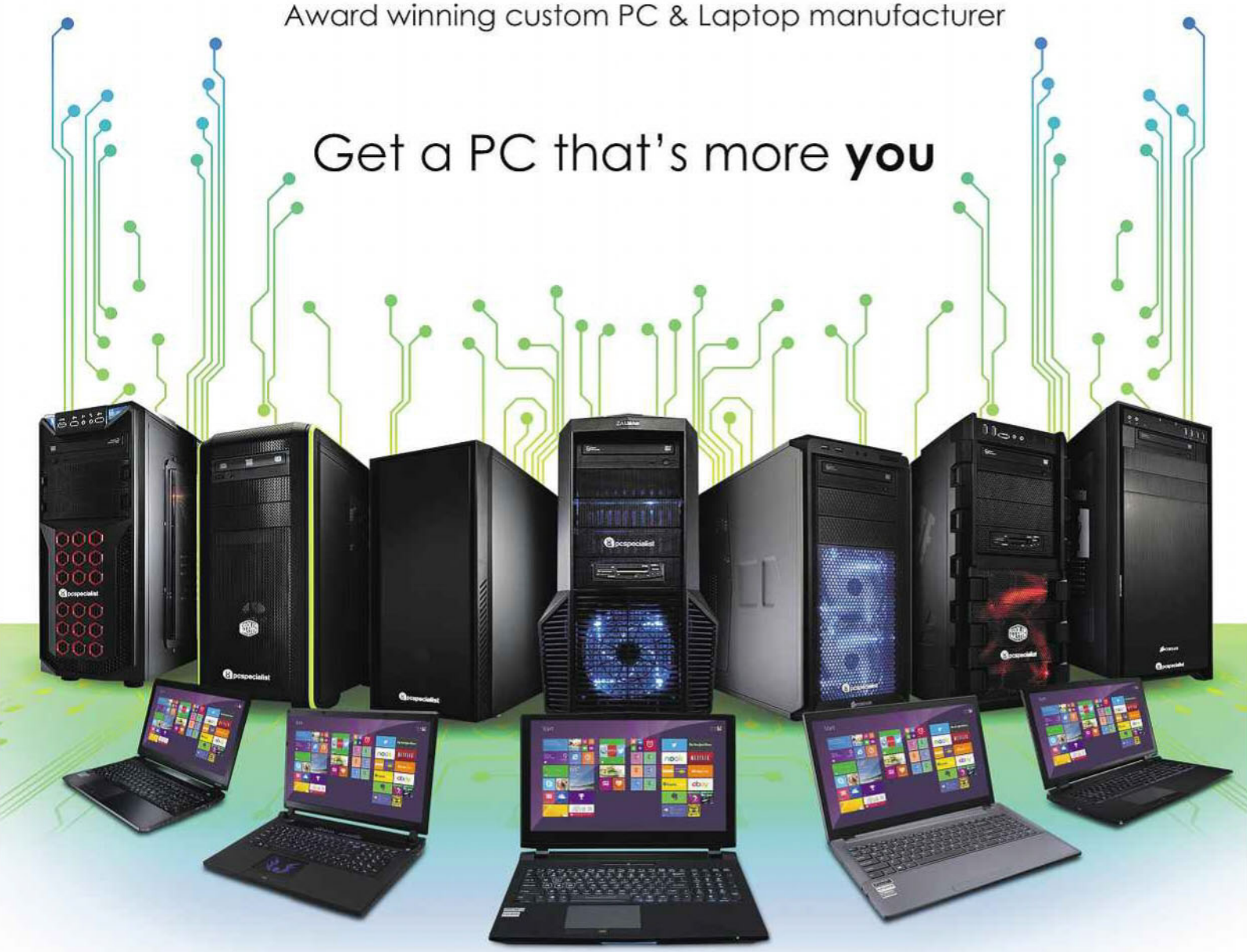

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businesses and organisations to allow Facebook to show their ads to people who have used their websites or apps away from Facebook. If you go to the Amazon website, for example, a cookie would be generated that would allow Facebook to target Amazon adverts at you. To opt out of this part, you need to go to the European Digital Advertising Alliance at www.youronlinechoices.com/uk and then make your Ad choices.

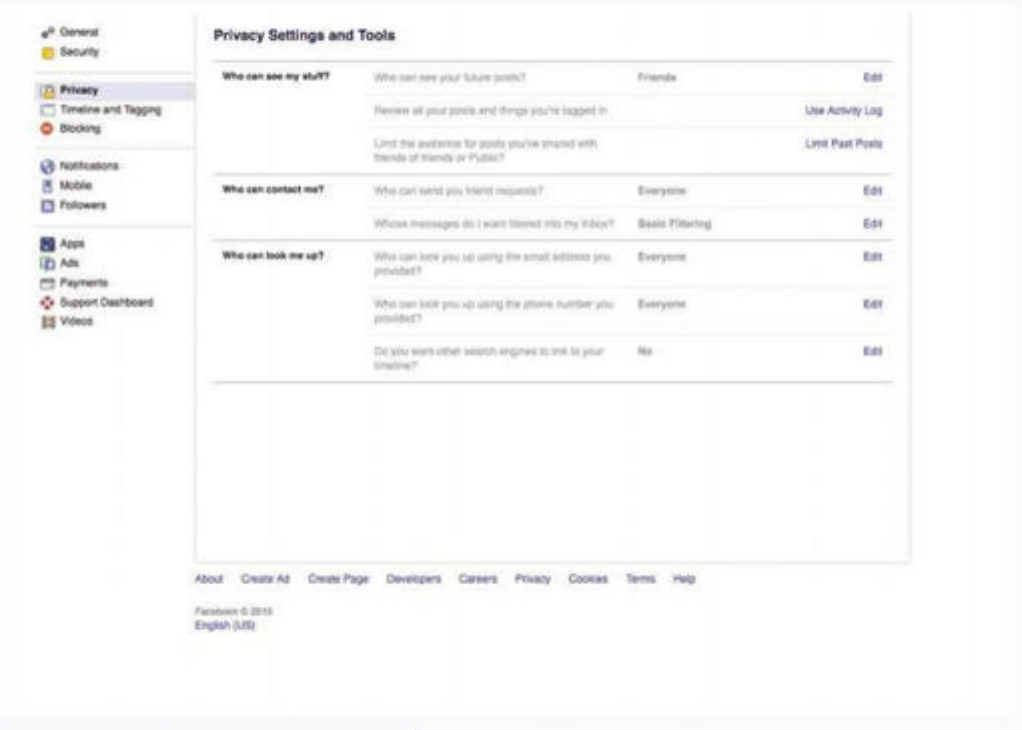
Facebook Doesn't Tell You Who Is Watching

Unlike LinkedIn, which can inform you of who is looking at your profile, Facebook prefers anonymity. You can view the details and posts of as many Facebook friends as you want, and they will be none the wiser, since Facebook doesn't allow people to track who is viewing a profile, and it doesn't let third-party apps figure it out either.

This move can actually be a stalker's paradise (although it's certainly not Facebook's intention to encourage such activities). A study in 2012 showed that as many as 88 % of people have checked on their former boyfriends or girlfriends on Facebook, often to scrutinise their potential replacement or to see if they're enjoying a better life. Anonymity also encourages low-level curiosity, as people check out friends of friends (or even enemies), and not being able to find out who may be looking at you is a tad unsettling.

But the anonymous nature of browsing Facebook also has another effect: it can make you paranoid. When you post something on Facebook, you often check back to see how many people have liked it. If you get one or two likes, you may feel rather dejected that you have been ignored. But how bad would you feel if Facebook told you exactly how many people had seen the post? That would give you a good indication of the percentage of people who have interacted with your post – while also showing exactly how many simply ignored it.

The bad feelings that this would generate means Facebook keeps that little titbit of information entirely to itself. After all, going along with the belief that no one actually saw your post is far more reassuring than the gnashing bitterness of knowing that everyone saw it and no one had the decency to even acknowledge it. Ignorance is quite often very blissful, although the same rule doesn't extend to advertisers. Knowing how many people saw an advertising post is crucial to their strategies.



Facebook Users Can Be Data Mined

Facebook has an advanced search engine, which makes it is possible to look for people according to their interests or details, such as whether or not they're in a relationship. Yet not only will the person involved be oblivious to this happening, it opens up the possibility of data mining.

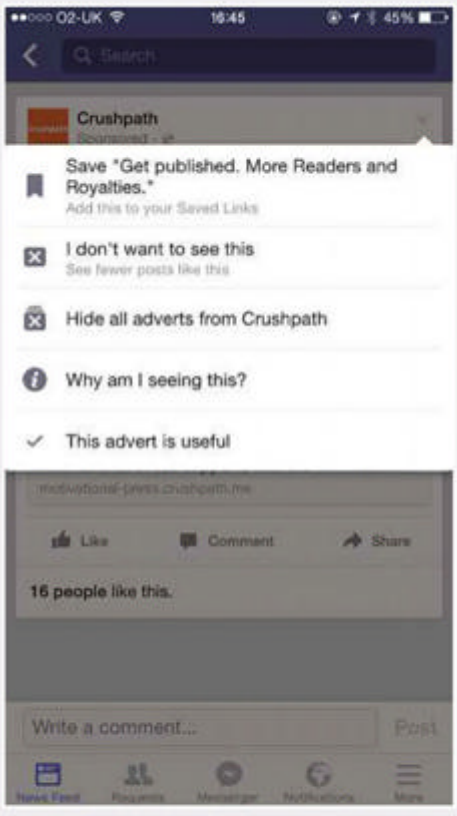
For example, typing something as innocuous sounding as 'single women who live in London and like Britpop' will bring up a specific set of results. A data-mining organisation could unscrupulously target the person with music-related spam that directly corresponds with their area of interest, or they could look to offer dating services for their location.

The key is to always avoid giving too much information away. Certainly exclude the year of your birth, your phone number, home address and any work-related information that could be used by competitors. And bear in mind that you don't have to

HOW TO ALTER YOUR ADVERT PREFERENCES

Find Out Why

When you see an advert on your news feed, you can discover why it is appearing. Tap the downward arrow and select 'Why am I seeing this?' from the drop-down menu.



be friends with someone in order for your data to be found and used by them. As always, those privacy settings can be your best pal.

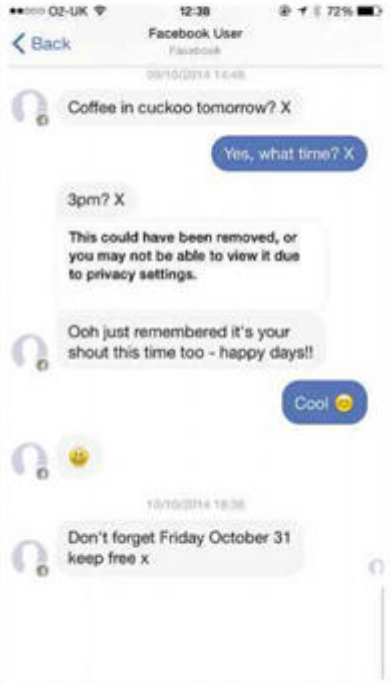
Facebook Users Are A Target For Spy Agencies

Together with Google, YouTube and Twitter, Facebook is a spy's favourite. Never before have so many people willingly given away so much about themselves. Last year, documents said to have been provided by Edward Snowden showed GCHQ had software designed to search for private Facebook pictures. And because the likes of Facebook are based overseas, the UK government has claimed it can justify mass surveillance by classifying posts on social networks as "external communications". This isn't a fault of Facebook, which has tried to persuade the agencies to put a stop to the practice, but it has put some people off from using the site.

Facebook Hides Who Unfriends You

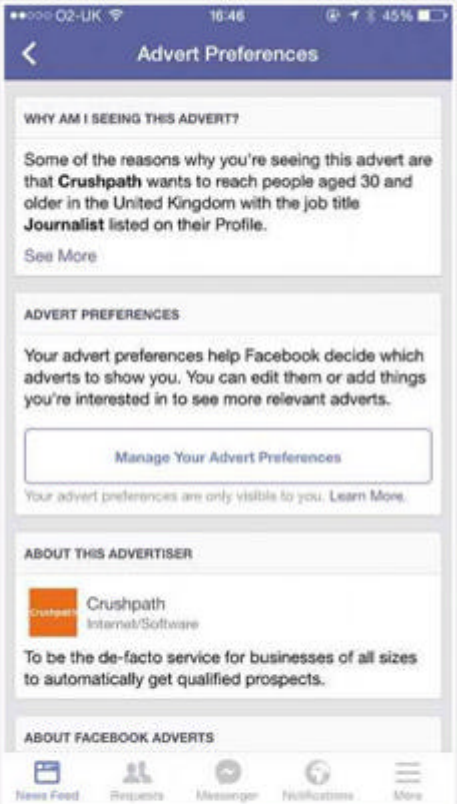
For a network that is about sharing information, Facebook doesn't half like to keep some things secret. It certainly doesn't like to tell you when you've been unfriended. The only way you can figure who has suddenly decided to drop you is by looking through your list of friends for possible absentees. Another way is by going through your messages to see who has become 'Facebook User'. That means the person you have been conversing with has decided to either leave the service or distance themselves from you.

Facebook likes to be a positive service. By making you feel good, it is



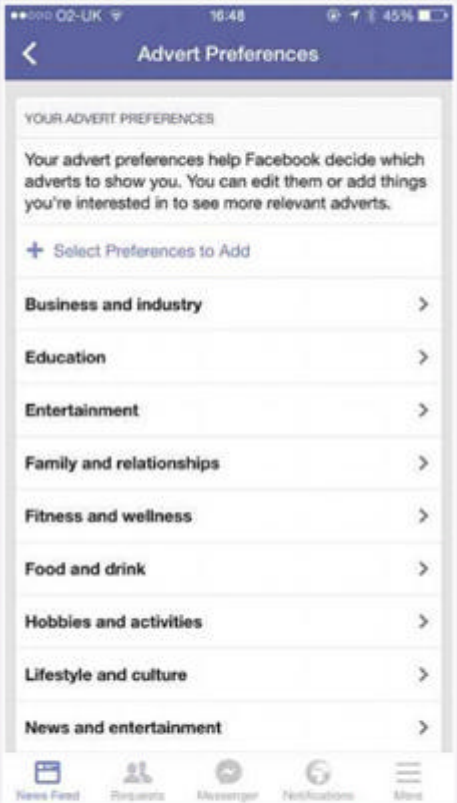
Why You

You will now see a reason for being targeted, as well as more information about the company involved and details about Facebook Adverts in the form of a video.



Manage Accounts

By tapping on Manage Your Advert Preferences, you can give Facebook a good indication of the kinds of adverts you do and don't want to see. Only you will see your preferences.



Choose Category

Tap on a category such as Education and then look at the subcategories. Decide what you do and don't want to see by ticking and unticking the entries.

more likely to have you coming back for more. Being unfriended doesn't have a positive impact on your life, and it can lead to you wondering what you've done wrong. So for that reason, Facebook has decided it can better if you don't immediately find out.

Facebook Can Use Your Content

When you upload content such as videos and photos to Facebook, you agree that it can be used by the social media service on a non-exclusive, transferable, sub-licensable, royalty-free worldwide licence basis. That means it could, if its wishes, allow another company or organisation to make use of your content.

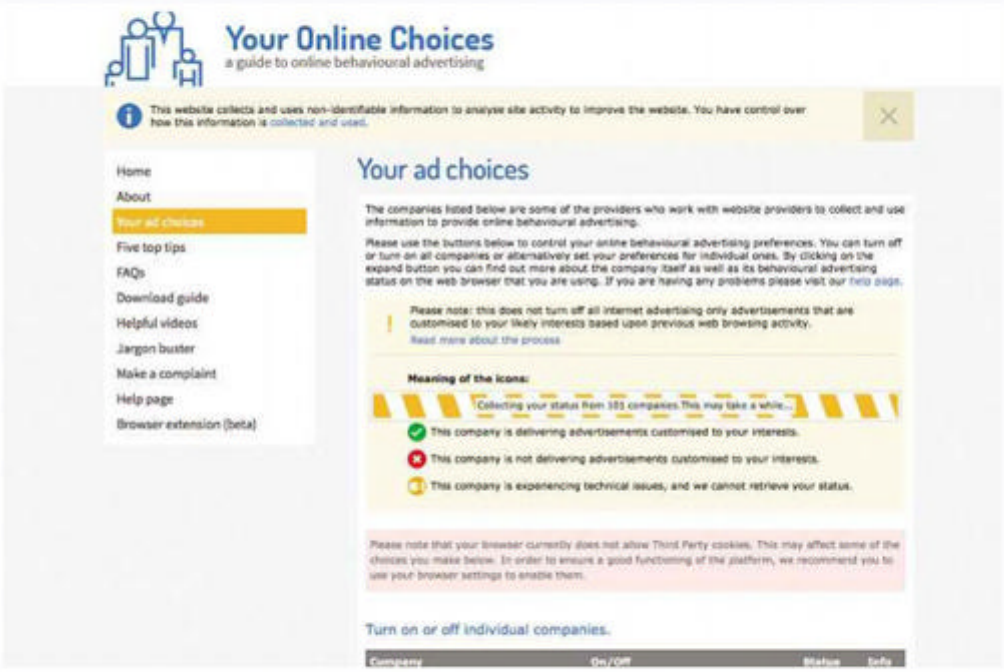
Even if you decide to delete your content, it can still be used if you had decided to share it with others. The Facebook licence will only end when those people delete the content too. For example, that group photo of you and your friends that is full of tags will be usable by Facebook until everyone associated with it breaks their tie. This protects other people from having content whipped away from their accounts, but it does mean that content you may not want on Facebook will remain there if someone is being awkward and refuses to disassociate themselves from it.

Facebook Can Take Your Suggestions And Make Money From Them

If you have a belting idea to make Facebook better and you give the company feedback, it may not pay you if it decides to run with it. It justifies this by saying that you were under no obligation to offer feedback or other suggestions, so it is under no obligation to compensate you. That does sound fair enough, and it covers the service from multiple claims to the same idea, but it may well make some wary about allowing Facebook to profit from their clever brainwaves.

Facebook Will Charge You If You Get Into Trouble

Facebook wants people to behave themselves when using its service, and rightly so. To that end, it ensures that it has covered itself against any possible legal action. If someone was to bring a claim against Facebook



because of your actions or because of something you have posted, then you agree to indemnify it against damages, losses and expenses. It clearly states, "we are not responsible for the conduct, whether online of offline, of any user of Facebook."

This is, to be fair, a standard clause for many of these kinds of services, otherwise they would be opening themselves up to all sorts of problems. But it is always worth bearing in mind that there are repercussions and that Facebook won't look to bail you out.

Facebook Can Give You A Virus

Although the company doesn't make a big fuss about it, it is, commendably, actively trying to clamp down on scams and cybercrime. It has set up a site called ThreatExchange, which has partnered with other internet firms including Dropbox, Pinterest, Twitter and Yahoo. Security experts are able to use it to share information about the latest threats in the hope that malware and phishing attempts are quickly halted.

The risk of getting a virus from Facebook is relatively low given the large user base, but because it's so easy for people to post links to external websites, the threat is always there. Facebook does have a security page at **facebook.com/security** that is worth checking out, giving you tips on how to protect your account and possible emerging threats.

Time To Quit Facebook?

So with all that in mind, should you be reaching for the quit button to leave Facebook? Most likely not. For all of its faults, Facebook remains a very usable and fun social network that is about as engrained in our lives as any technology could be. Besides, leaving isn't that easy. Not only do those who quit often feel compelled to return at some point, merely deactivating a Facebook account means the company retains your data so you can easily come back and pick up where you left off just by logging in again. There can be an overwhelming desire to plunge in again.

Instead, it's probably better to change the way you use it and to refrain from giving too much information away. You should go through every part of your Privacy settings and tailor Facebook to suit you. You should also work out what you want to see and what you don't and alter your habits to suit by interacting or telling Facebook to ignore certain posters. But above all, you should give the terms and conditions a full read, never post anything that could get you into trouble, and always bear in mind that someone, somewhere could be watching you whether it's a friend, foe, advertiser or GCHQ. **mm**

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RECOVERING DELETED FILES

Aaron shows you how to resurrect lost files and data, saving a lot of headaches in the process

We've all been there, that moment when you realise a needed file or folder has mysteriously vanished. The last time you remember, it was there, waiting for you to peruse the file or folder contents, but when you come to actually look at it, it's gone. You could have accidentally deleted it, or it could have been removed by another means, such as a system clean. Either way, it was data you needed, and it's now gone. Is there anything that can be done? Can you get this data back, saving you a lot of time and effort, or is it gone forever?

With a little luck and the right tools and know-how, no, all is not lost. It is possible to recover data, and there are a number of ways you can go about it, ranging from the simple to the complex. Whatever method you need to employ, aside from the harshest of scenarios, there's usually a way to recover your lost data. So without further ado, let's take a look at some free options open to you.

The Simple Options

Although it's something many of us will instinctively check, it's sometimes easy to overlook the simple option of the Windows Recycling Bin, especially if your lost data has caused you to panic and worry about the ramifications of its loss. Such worrying situations often cause us to overlook the simple options, so don't forget to keep things simple to begin with.

The Windows Recycle Bin is where all deleted files go, unless you press Shift+Del to permanently delete the file, which will bypass an entry in the Recycle Bin. Even then, it's still possible to recover a lost file, but we'll look at this later. Assuming any potentially lost data has simply been deleted the usual way, try double-clicking the Recycle Bin to rummage through the deleted contents. Anything still in the Recycle Bin can be easily recovered by right-clicking it and selecting Restore. This will restore the file to the location it occupied before it was deleted. Easy.

Of course, this is the best case scenario and most will obviously know about this and check it right away, so this may not be the answer. In this case, some extra help

> **With a little luck and the right tools and know-how, no, all is not lost**

is needed, and this is where file recovery programs come in.

File Recovery Apps

The most common method used to recover lost files is the use of a third-party file recovery application. These are programs that can scan a hard disk for references to deleted files and recover them. This is made possible by the way in which files are deleted in the first place.

When you delete an item on your hard disk, the file itself isn't actually deleted. All you do when you do this is remove the reference to the file in the file system table, and Windows no longer sees the data. This means the space the item takes up can be overwritten. Until this happens, which often isn't right away, the data remains intact. File recovery programs are able to find these files without the file reference and can restore them for you. It's a relatively simple procedure, and it's easy to do with the right software.

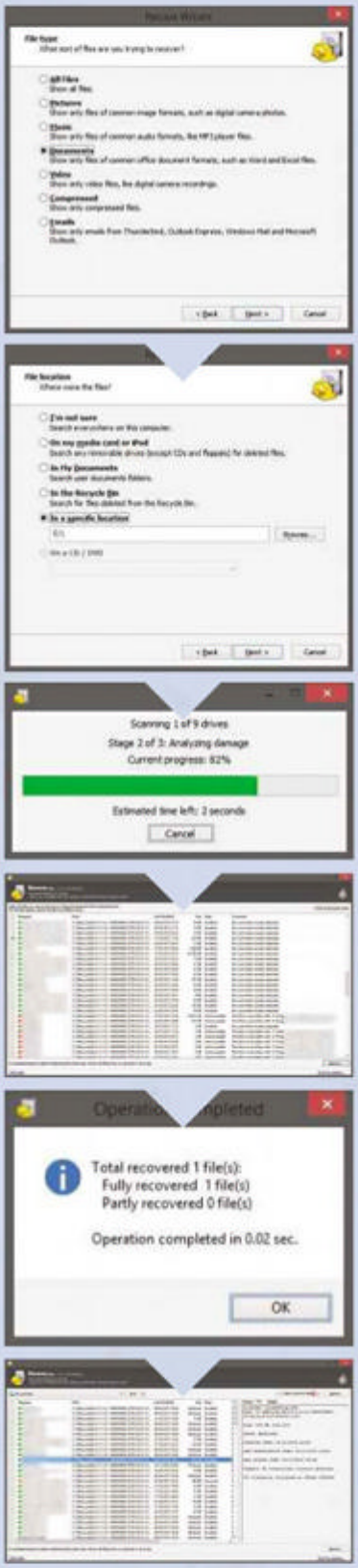
There are many such programs around, and many major software publishers have their own options. However, these can be costly, and you may prefer to look for free alternatives, which is where we're going to focus, with a brief look at just a few of the available choices.

First up we have Recuva (**www.piriform.com**). This comes from the publisher of another product we often cover here in Micro Mart, Malwarebytes. Recuva can be used to scan your hard disk(s), as well as media cards or USB sticks for recoverable files, even after a format of the volume. Once a scan has been run, the program will display a list of results, along with an assessment of the possibility of recovery, as well as a hex preview of the data.

A useful feature is the option to limit a recovery search for files of a specific type, such as media or text documents, and the deep scan is a very useful tool for ensuring you have the best chance to find those required files. The program also features a secure file deletion tool. For more information on this, see the File Shredder box elsewhere in this article.

Recuva is a great tool, and it doesn't even need to be installed. All you need to do is extract the files from the downloaded archive and double-click the exe. Easy. For more information, check out our simple step-by-step guide on using this free tool.

Using Recuva



Recuva is one of the best free file recovery tools around, and it's also easy to use. To give you an idea, here's a simple step-by-step on using the program.

Step 1: Once you've downloaded the program, simply extract it and run either the 32 or 64-bit version, with the latter being applicable to those with 64-bit CPUs and operating systems. At the first screen, all you need to do is select the type of file you're looking for. If you're not sure, just check 'All Files' and click 'Next'.

Step 2: Next you need to pick the location to search. You can select the 'I'm not sure' option, which will search everywhere, but this can take a while. Alternatively, pick a more specific item or use the browse option to navigate to the exact location, if you know where the file was. You can also search optical media.

Step 3: Once you've picked your settings, you can start the search. Recuva will go through several stages during the scan, such as locating files and analysing any damage. This process can be quick if you know where the files were, or it can take a while if you have to search the whole system.

Step 4: Once the scan is complete, you'll see a new screen with a list of checkable files, along with names, file paths, modified dates and, importantly, the current state of the file. This lets you know if the file is likely a possibility for recovery. To try to recover any files, check the box next to them and click Recover.

Step 5: The recovery process will occur automatically and shouldn't take too long for most files. Once it's done, you'll see a simple completion box that will let you know if a file has been fully or only partially recovered.

Step 6: If you're a more advanced user or you want more help identifying files to be recovered, click the Advanced View button to the top-right of the main screen, and you'll find extra tabs, including a hex header viewer and an information panel with the name and more information about the file. If the file is able to be previewed (such as an image), you can also see it here.

Another option is Disk Drill (**www.cleverfiles.com**). This is another popular option and one that claims to be able to recover deleted or lost data from almost any storage device, be it PC hard disks, USB drives or iPods. Like many tools of this type, it uses both quick and deep scan algorithms, and once a scan is complete, you can try to

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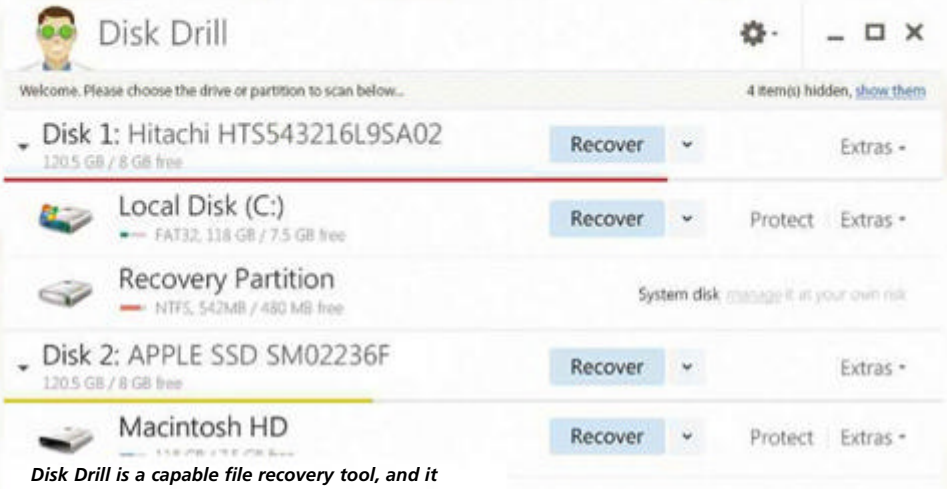
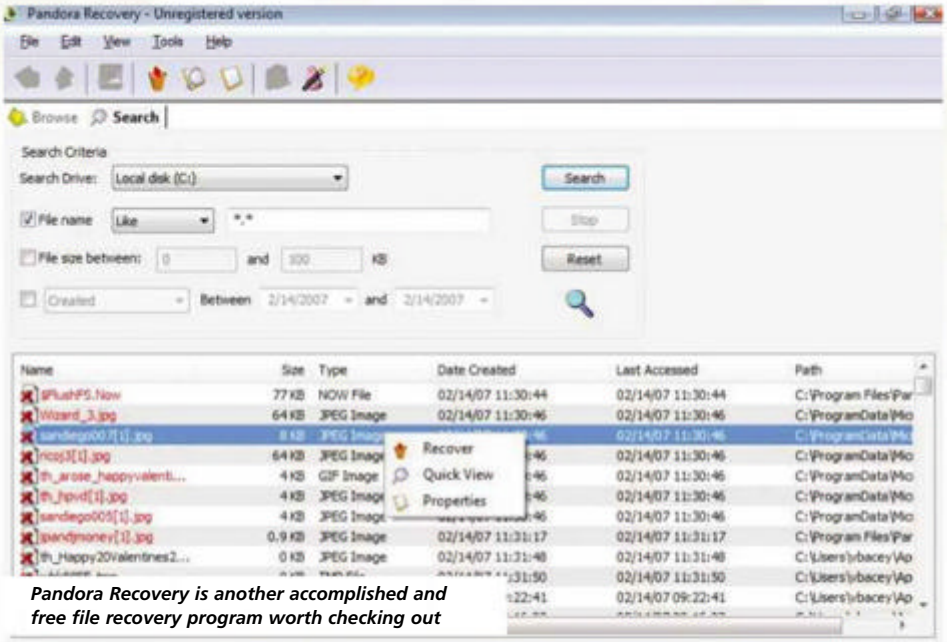


Disk Drill is a capable file recovery tool, and it supports a wide range of file systems



Pandora Recovery is another accomplished and free file recovery program worth checking out

recover any detected items. Interestingly, you can also view results in real time as the scan runs, so you don't even need to wait for the scan to finish. The program supports all kinds of file system and can recover partitions.

Our final example here is Pandora Recovery (**www.pandorarecovery.com**), which is another favourite of PC users looking for a free file recovery option. This program can recovery files from FAT16, FAT32 and NTFS formatted drives. It offers a quick scan option if you're looking for freshly deleted files and a deeper scan for files that may have been overwritten.

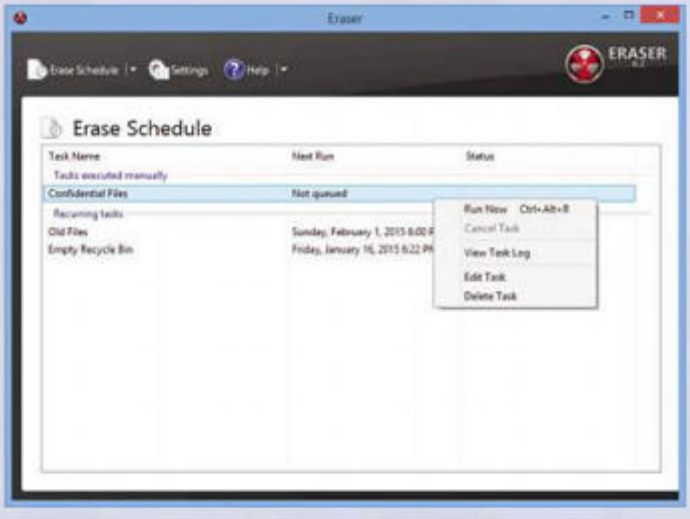
> **Data loss is pretty much a given at some point in any PC user's life**

Post recovery includes a list of files that have been found, along with the likelihood of a successful recovery operation. You can also search results for specific files, sizes and other criteria.

All of these programs are very useful, and in many situations, files can be recovered, even if you have to use the longer, more in-depth scans these tools offer. Sadly, however, as files get overwritten, the likelihood of recovery drops dramatically.

File Shredders

Although we're looking at preventing the loss of data, we should also talk a little about the secure deletion of files. Just as file recovery tools can be a huge benefit, their ability to recover deleted files can also make them a security risk. You may have deleted a file for good reason and don't want anyone else stumbling over it. If someone can easily recover it, that's not good. This is where file shredders come in.



These applications are designed to securely delete data so that it can't be recovered. Instead of simply deleting the reference to a file, as Windows and other operating systems do, they also overwrite the file multiple times, thus minimising the chance of a successful recovery. Different programs demonstrate more effective shredding than others, and there are some very powerful commercial options that boast advanced features. However, most of us won't need this kind of power, and there are plenty of free options that will ensure your data stays deleted.

One such option is Eraser (**www.heidi.ie**). This is a free file shredder that overwrites your data numerous times and does so quickly. It features various secure deletion methods, such as Gutman and USDoD, and it can be integrated into the Windows context menu for easy access. It's a great tool and one of many that can help keep your data private, even after you've deleted it.

< If you want to ensure sensitive data stays deleted, you'll need to use a file shredder like Eraser

Damaged sectors also make recovery using domestic applications less likely.

In situations like this, one of the only options is to seek professional help, which often means sending your drive to a specialised service that can perform high-end data recovery procedures on it. These services will inevitably have more success, due to their professional equipment and means, but even this is no guarantee, and it can also be expensive. So the best idea world really be to prevent data loss in the first place. Enter the backup.

Prevention Is The Cure

Data loss is pretty much a given at some point in any PC user's life. We all lose data, and dealing with it isn't always straightforward, so preventing it is a great idea, and the best way to do this above and beyond careful PC use is to back up your important files. Now, this is possible manually, by simply copying files to a secure storage location, but this can be time consuming, which is why backup programs are far more useful for most. Using these, you can perform and schedule backups utilising a host of advanced features. If you're serious about protecting your data, you really should look into this. Here are a couple of great, free options.

Cobain Backup (**www.cobiansoft.com**) is a full backup suite that you can use to back up files, either locally or to an FTP server remotely. It makes this whole process easier, as you can schedule backups so they run automatically at set times, only backing up files that need to be copied due to changes. This can even be done if files are in use, so you don't have to stop using your PC when the process runs. Backups are also encrypted, so they're even more secure.

File Repair

As we've already mentioned, files are not always easily recovered, and if they're actually damaged in some way, either by overwriting or other issues, getting these files back can be challenging. In these cases, you could try using a file repair tool.

These tools are designed to attempt reconstruction of a damaged file, in order for the item to be retrieved. They can be found in various different guises, with some applications designed for a specific task. For example, CD Recovery Toolbox Free (**www.oemailrecovery.com**) is an application that specialises in the recovery of data from scratched or damaged optical discs. This includes CD, DVD and Blu-ray. Recovery is not guaranteed, but it can actually retrieve and reconstruct data from a damaged disc, making it a very useful recovery tool.

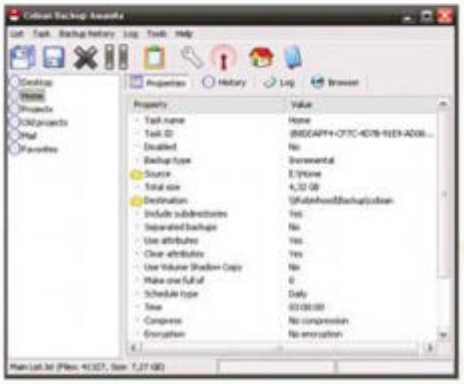
Likewise, DiskInternals Zip Repair (**www.diskinternals.com**) is a program that focuses on the recovery of damaged or corrupted Zips archive files. It can analyse and reconstruct the structure of a damaged archive and attempts to create a new, working copy of the file so you can access it normally.

EaseUS Todo Backup Free is great as a backup tool and also as a system recovery aid

"It's very possible to recover some data that you might have thought lost for good"

EaseUS Todo Backup Free (**www.easeus.com**) is a powerful free backup solution, which features full automated backups, and it also features a selection of system-centric options, such as the ability to back up partitions, complete with current software installations and settings for system troubleshooting purposes. You can even mount backup images as virtual partitions and can use backups to restore a system to working order. Extra tools feature a disk cloner and the ability to create bootable recovery discs. This makes it a well-rounded solution for both backing up data to protect it and to look after your system as a whole.

As you can see, it's very possible to recover some data that you might have thought lost for good, all without spending anything, and if you're careful and make use of the right tool, you can also keep the need to recover data to a minimum. So take these important steps. They really can save you from a data loss nightmare. **mm**



Cobain Backup makes running backups easy and doesn't interfere with your daily work

MICROSOFT BAND

David Briddock explains why the Microsoft Band has plenty of potential

These days, Microsoft is keen to drop surprises. A recent example was its new Microsoft Band wearable product and associated Health app.

The marketing blurb states that the Microsoft Band is a fitness and activity tracker with GPS, basic smartwatch functionality, multi-platform app support and much more. But what's the reality?

Initial Experience

Purchase this product, and you'll receive an attractive package that opens up like a ring box, with the Microsoft Band prominently displayed. Inside there's also a proprietary USB charging cable, with magnetic connection.

The Band itself may look a little bulky when compared to some other activity trackers. These dimensions are necessary to house the large number of sensors, which includes a location-sensing GPS receiver.

For some, this may mean the Band is a little uncomfortable on the wrist. But then again it is available in small, medium and large strap sizes and actually weighs in at just 60 grams.

The front of the Microsoft Band is dominated by the 11mm x 33mm, full colour, TFT, capacitive touch-enabled display, which has a resolution of 320 x 106 pixels. The power and action buttons are located at the bottom of this display.

The Band's thermoplastic strap has a novel clasp mechanism, and two buttons are pressed to open a securing piece, allowing it to slide up and down a slot. It works well, ensuring rapid adjustment and a secure fit on the wrist.

Familiar Interface

Just like Windows 8, and the new Windows 10, the Band has a tile-centric interface to compliment its responsive touchscreen. The display's colour and background wallpaper are user configurable.

An ambient light sensor adjusts the brightness of your touchscreen display automatically, and a tiny haptic vibration motor adds sensory feedback to the touch experience.

Currently there are a total of 17 tiles, though we can expect this number to rise with future software updates. The display can show up to three tiles at once, with up to 13 tiles being active at any one time. And, of course, each underlying tile app is optimised for the touchscreen display.

It's easy to scroll through the tiles, and you can rearrange the tile order to suit your daily routine. Nevertheless, with such a small display, it's best to only activate the tiles you'll use most often during your daily routine.

Living With Band

It makes no difference to sensor operation whether you decide to wear the Band in classic top-of-wrist watch mode or with the display attached underneath the wrist. However, installing your screen protector as soon as possible is highly recommended, especially if the display is underneath the wrist.

The charging connection for the two 100mAh rechargeable lithium-ion polymer batteries is made underneath the display. A full charge takes less than 1.5 hours and typically lasts about two days. However, switch a few things off, especially power hungry elements like the GPS sensor, and you might get more.

Wireless communication is handled by a low-energy Bluetooth 4.0 chip. There's a simple setup wizard that walks you through connecting your phone via wireless Bluetooth and taking your first steps with the Microsoft Health app.

Alternatively you can use the magnetically coupled USB connector, which is similar to the one found on Microsoft Surface tablets or Apple's MagSafe connector.

From the fitness perspective, the Band offers quick access to your activity history and workout information. The main screen displays your steps, calories burned, sleep history, fitness history and workout programme progress. The Band also connects to various smartphone apps, such as RunKeeper and MyFitnessPal.

In addition, there are a number of productivity apps. Mailbox activity and

email previews are just a glance away, while a calendar sends alerts directly to your wrist, and the built-in timer and alarm functionality comes in useful for setting lap targets or as a gentle and noiseless morning wake-up alarm.

Band Sensors

Microsoft has equipped its Band with an impressive sensor collection. A couple of sensors are located on the left side of the display, but the main sensor area is located at the bottom of the inside of the band. Here you'll find heart rate, skin temperature and many other sensors

When combined, the data from these main sensors, along with your personal profile information, are used to assess your activity levels. Turning on one or more of the optional sensors can improve the accuracy of these calculations.

Let's take a look at some of these sensors and what they offer.

Heart Rate Monitor

Microsoft Band continuously monitors and display your current heart rate, day and night. Heart rate data supplements and refines the calories burned measurements and performance statistics from walks, runs, workouts and sleep.

An optical heart rate monitor, located at the back of the clasp and surrounded by a green glow, uses a light sensor to detect tiny fluctuations in your capillaries.

To discover if the Daily Heart Rate monitor is active, drag the 'Me Tile' to the right and look for a Heart symbol. If you're tracking a run, a workout or your sleep, it will turn on automatically.

When the light sensor is searching for your heart rate, the Microsoft Band displays 'Acquiring', then 'Locked' once your heart rate is detected. If you're wearing the band too loosely or not at all, a reminder message to this effect will appear.

Turning the Daily Heart Rate monitor off saves battery life. However, estimates of your calories burned are less precise when heart rate data is missing.

As you go about your daily activities, heart rate fluctuation statistics are constantly available. Just select the Microsoft Health app on your phone and a chart of your steps or sleep pattern is just a tap away.

Accelerometer/Gyrometer Sensors

The three-axis accelerometer and gyrometer sensors detect motion or the lack of motion when you're in a deep sleep.

In a simple scenario, data streams from these sensors can be used to count your steps. When combined with profile information and heart rate measurements, it helps determine how many calories you've burned during a particular exercise session or throughout the whole day.

However, more sophisticated apps will interrogate the same data to glean deeper activity insights and patterns – for example, your nightly patterns of light and restful sleep.

GPS Chip

Many fitness bands and some smartwatches (including the Apple Watch) don't have a GPS chip, but the Microsoft Band does.

The 'Run Tile' is used to start and stop GPS tracking. When GPS is

Links
Home: microsoftband.ms
Developer: developer.microsofthealth.com

activated, the Band accurately tracks the distance travelled over a particular time for activities like walking, running, hiking or biking.

The Band also stores a record of your route for future analysis. When this data is synced back to the Microsoft Health app, you can retrace your route as displayed on a map and scrutinise checkpoint times.

Skin Temperature And Galvanic Skin Response Sensors

The Galvanic Skin Response (GSR) sensor measures the conductivity of the skin area between the clasp GSR sensor and the secondary GSR contact point, which is under the Band's display face.

It's GSR data that's used to determine if the Band is currently being worn or not. Also, skin temperature measurements have obvious uses for accessing how you're responding to a particular workout. But so far more imaginative applications haven't materialised.

Interestingly, GSR technology is also used in certain types of lie detection equipment, so who knows what Band apps we might see in the future.

UV Sensor

A useful summer-time feature is the ultraviolet sensor, which gathers a cumulative picture of this damaging electromagnetic radiation.

Monitoring the UV readings means you'll no longer have to guess if it's a good idea to apply some sunscreen, wear a hat or disappear off into the shade for a few hours.

Microphone

Maybe not a true sensor, but a critical component nevertheless, a built-in microphone means you can interact with Cortana, Microsoft's personal digital assistant. However, to use this feature today you'll also need a Cortana-enabled Windows Phone.

With Cortana active on both your phone and the Band, just press a button and speak into the mic (to the left of the touchscreen) to ask Bing a question, check today's weather, set a reminder, dictate a message and much more – all without having to take your smartphone out of your pocket.

As Cortana is rolled out with Windows 10, in summer 2015, you'll be able sync the Band with tablets, laptops and desktops as well as smartphones.

2015 Update

In February 2015, there was a significant Microsoft Band update, including some great productivity features that are accessible while exercising or when a user can't easily engage with their smartphones.

As Microsoft Research senior researcher Tim Paek said, "If you get an urgent message and you need to respond right away, it can be very inconvenient to rummage around for your phone. With the device on your wrist, you can reply easily and discreetly."

In particular, there's an innovative Virtual Keyboard, designed specifically for the Band, and the new Voice Replies functionality powered by Cortana.

With the Virtual Keyboard, you can edit that text using the tiny yet surprisingly usable QWERTY keyboard displayed on the diminutive screen.

Band Sensors

- Optical Heart Rate
- 3-axis Accelerometer
- Gyrometer
- GPS
- Ambient Light
- UV
- Galvanic Skin Response
- Skin Temperature
- Capacitive

"It's the smallest keyboard around, so we designed the layout to leverage the entire screen real estate for tapping on the characters you want," said Paek. "We also made it easy to tap and edit words. We're definitely upping the ante here on input for wearables."

Virtual Keyboard builds on core Microsoft Research technologies developed for the latest Windows Phone. This includes Word Flow, which helped Windows Phone set a Guinness World Record for both sighted and blindfolded texting on a touchscreen device.

Speech recognition is made possible through Cortana, the personal assistant app for Windows Phone. As you speak, the Band displays the words it detects.

But there's more. Microsoft researchers have now applied machine learning techniques to enhance the responses previously available on the Band.

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This intelligent auto-reply feature means the Band can analyse all kinds of communications, then suggest message responses. As in 'Yes' or 'No' type questions or when an appropriate response is "I'm almost there."

For another example, imagine you're about to leave work and your partner sends a text asking whether you'd prefer Chinese or Mexican food for dinner. Microsoft Band can recognise that the best response involves just two choices, namely 'Chinese' or 'Mexican', which can be presented as single-tap auto-reply buttons.

This close partnership between Microsoft Research and the Microsoft Band team is a clear indication of the cultural shift taking place at Microsoft under the leadership of CEO Satya Nadella.

Cross-Platform Nature

As you'd expect, the Microsoft Band has no problem working with Windows Phones, such as the new Nokia Lumina 640 or 640 XL, ideally running version 8.1. And of course, this means you'll have full access to Cortana directly through the Band's built-in microphone.

However, Microsoft wanted to make a cross-platform device, unlike many of the alternative fitness bands and smartwatches in the marketplace today.

Microsoft says the Band supports the Apple iOS 7.1 operating system running on 4s, 5, 5c, 5s, 6, and 6 Plus iPhones, plus numerous Google Android 4.3 and 5 (Lollipop) smartphones with Bluetooth support.

Apple iPhone owners seem happy, even those who have the latest iPhone 6 an iPhone 6 Plus. And the Microsoft Health app works as expected, including RunKeeper data integration and route map display. Plus I've seen good reports from other smartphone owners, such as the Sony Xperia Z3.

SDK

Microsoft wants the Band to be a hit with as many consumers as possible and not just Windows users, so in addition to Windows Phone, you can download the Band's software development kit (SDK) for Apple iOS and Google Android.

But what can you do with this SDK?

Well, it has access to all the Band's sensors, the sensor data store and the complete user interface including tiles.

This means you could design an app that sends motivational information to the display, while the owner is still undertaking their run, cycle or other exercise routine. Or you could develop brand new apps that imaginatively merge data from multiple senses to provide new ways to interpret your daily activities, fitness exercise routines and sleep patterns. Or perhaps we could have apps that have deep, data-centric relationships to existing smartphone apps such as instant messaging integration, important glanceable notifications and the latest news headlines on user-definable topics.

Alternatively you might just like to provide an interesting way to set colour themes and wallpapers.

Final Thoughts

Microsoft Band is one of the most flexible fitness bands available, thanks to its extensive sensor array, cross-platform apps and open development environment.

Other Features

- Capacitive 1.4" TFT full colour display.
- Bluetooth 4.0.
- Microphone.
- Haptic vibration motor.
- Magnetically coupled USB connector.
- Dual 100mAh rechargeable lithium-ion polymer batteries.

Compatibility

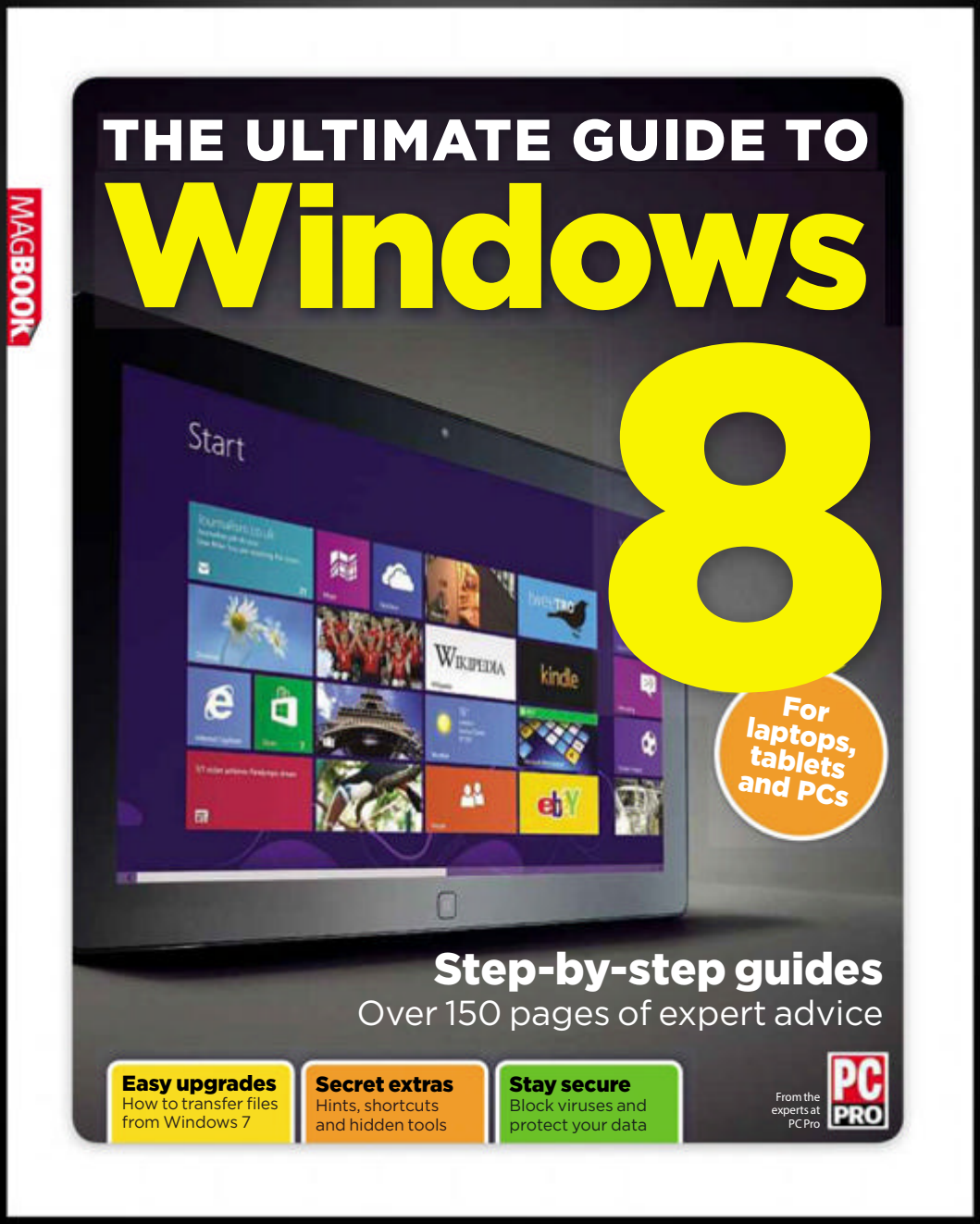
- Windows Phone 8.1 or later (with Bluetooth 4.0)
- iOS 7.1 or later (iPhone 4s, 5, 5c, 5s, 6, 6 Plus)
- Android 4.3 to 5.0 smartphones (with Bluetooth 4.0)
  (list to be extended after Windows 10 release)

The suggested retail price is £169.99 for the mid-April 2015 UK launch, via PC World, Currys, O2, Amazon and others. This may seem a little steep, but remember, it's a powerful activity tracker with GPS functionality and a basic smartwatch too.

And as we've seen with the February 2015 update, there's plenty more to come, so Microsoft is probably already thinking about extending its wearable device range. **mm**

Everything you'll ever need to know about **Windows 8**

MAGBOOK



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Component Watch

Component Watch

Fancy taking the plunge and picking up a 3D printer? Check out these deals, then

The advent of 3D printers has created an industry based around enthusiasts, and it doesn't seem like it's going away any time soon. However, the price of 3D printers feels like it's keeping a lot of people out of what could be an interesting hobby – or at least an extension to an existing interest. With that in mind, we've looked at some of the most popular commercial 3D printers out there and found the cheapest prices for them. Just try to remember that 'cheapest' is a relative term, and in this case certainly doesn't mean 'cheap'.

Deal 1: 3D Systems Cube (2nd Generation)
RRP: £1150 / Deal Price: £500

As long as you don't mind buying it in white (other colours are still more expensive) you can get more than 50% off the 2nd Gen 3D Systems Cube Printer, which is compatible with Windows and Mac and can produce objects 140mm³ in size, in up to 18 different colours. Interestingly, it ships with a neon green cartridge, which will help to give everything you create that fresh out of the early 90's feel (or prompt you to buy another). Nevertheless, this is an undisputed bargain that only begs one question: seriously, who is shallow enough to care what colour their 3D printer is?

Where to get it: Ebuyer (**bit.ly/1GKpdWu**)

Deal 2: 3D Systems Cube (3rd Generation)
RRP: £1150 / Deal Price: £988

This wi-fi compatible printer allows you to send your jobs directly from the Cubify app without a computer being attached. Its dual-jet design allows you to print dual-colour items at up to a maximum of 152.5mm³. Aimed explicitly at home users, it's simple to set up and easy to use, with up to 20 different coloured materials available to sculpt your creations in. It comes with two free cartridges in the box and 25 free designs for you to try your new piece of kit out on. Yes, it's expensive, but if you want to get into 3D printing, the price is reasonable.

Where to get it: Trust Hardware (**bit.ly/1avPOIH**)

Deal 3: Velleman K8200 3D Printer Kit
RRP: £600 / Deal Price: £396

The Velleman K8200 3D Printer kit allows you assemble your own 3D printer at a super-low price. With a maximum printable area of 200mm³, it's fast, reliable and precise, and compatible with all free RepRap software and firmware. The printer is manufactured from aluminium profiles and is straightforward to assemble, leaving room for you to modify and customise it to meet your own personal needs. The ideal starting point for any 3D printing enthusiast.

Where to get it: CPC (**bit.ly/1bIUV0U**)

Deal 4: Up Mini 3D Printer
RRP: £600 / Deal Price: £546

The Denford Up Mini is a low-price, ready-to-use mini 3D printer which can print models up to 120mm³ in size, with a simple USB interface and all the software you need to get started. The pack includes three Perf Boards and a 700g spool of white ABS so that you've got everything you need to get started, and it's compatible with all versions of Windows as well as Mac OS X.

Where to get it: Zavvi (**bit.ly/1DHFEAq**)

Deal 5: XYZ Printing Da Vinci 1.0
RRP: £450 / Deal Price: £429

The Da Vinci 1.0 is an affordable plug-and-play 3D printer designed for personal, home use, small businesses, and educational establishments, with a 200mm cube printable area, built-in safety features and an open-source database of free 3D object designs to get you started. There's no assembly or equipment adjustment required, and its three-step EZ Mode makes 3D printing simple and painless for non-experienced users.

Where to get it: Technology Outlet (**bit.ly/1CK6c03**)

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CyberCenturion Final Takes Place At TNMOC

Young security professionals showcased

Wi-fi Calling From EE

Mobile drop-outs a thing of the past?

Mobile coverage can be patchy. Even from street to street, reception drops-outs can occur that can prove frustrating in this modern world, where we expect to get everything we want on a silver platter.

EE has addressed the coverage conundrum with the launch of WiFi Calling, a service which the network provider claims will help over four million people in the UK who say that they lose reception in at least one room in the home. WiFi Calling uses a phone's normal dialler and contacts book to make calls rather than 'over the top' services enabling calls using WiFi, with friends not having to be on the same closed user group services to communicate with one another.

No app is required either and this service is going to be first available on the Lumia 640, Samsung Galaxy S6 and S6 Edge devices, with more new and existing handsets added to the service in the coming weeks. The plan is that by the summer, over five million EE pay monthly customers will have access to WiFi Calling. Read more at **www.ee.co.uk**.

Divorce Through Facebook

Not as tactless as it might sound

The very idea of sending somebody divorce papers via Facebook sounds preposterous, right? A judge in New York doesn't think so, though, as he ruled that papers could be served via Facebook Messenger.

The thing is, it's not as ridiculous as it first sounds as permission was given as the husband in the case had been extremely difficult to contact. With no fixed address, no job and having refused to be part of the divorce process, the judge made an exception and passed the ruling that Facebook was a vaild communication medium in this particular instance, according to a report at New York's *Daily News* website.

It does potentially set a precedent for similar cases in future and perhaps further demonstrates the wide-ranging communicative quandaries social media presents us with.

QUICK BITS... **Intel has been blocked by the US government from assisting China in updating the Tianhe-2 supercomputer, over**

CyberCenturion is a UK national competition run by Cyber Security Challenge UK and Northrup Crumman that aims to inspire students to take up careers in cyber security. Giving them the chance to experience scenarios and challenges faced by existing professionals out in the field, the event's first final has taken place at The National Museum of Computing.

It was happening at the time of writing so we don't have the results, but suffice to say that the teams of four to six youngsters aged 12-18 will have worked hard to prove themselves the best in a field of strong competition. Best of all, they competed in the very same Block H that housed the famous Colossus computer that played such a vital role in World War II.

To all involved, well done. We'll try to bring you the name of the winners as soon as we can.

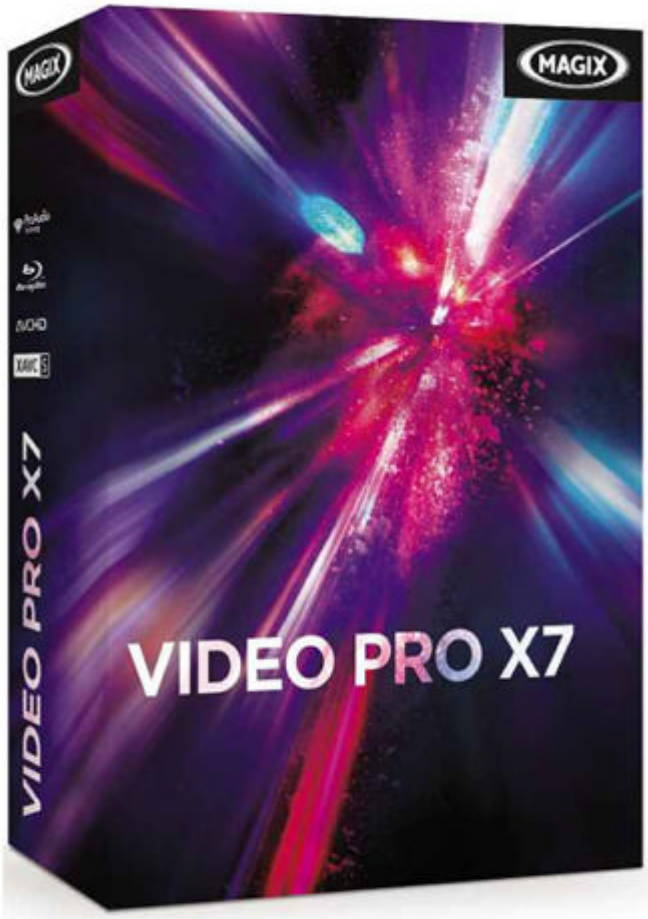
High-End Video Editing Package From Magix

Seventh heaven for pro package?

Magix might be better known to you as a provider of affordable consumer software but it also has a hand in professional, high-end tools. Tools such as Video ProX7. The latest version of the company's video editing package, Video ProX7 has upped the ante with a smattering of new features and optimisations to end up with what Magix reckons is the "best price-to-performance ratio in its class".

Whether that's true or not is up for debate, but let's take a look at the bare facts: video ProX7 features a generous level of functionality as befits a professional-targeted product. First of all, it's been completely redesigned on the back of customer feedback with a new, modern look and a project-driven interface. The first Magix product to support both hardware-accelerated encoding and H.264 video decoding, optimised for Intel IRIS and other GPUs, there is also support for the import and export of Sony's XAVC S format.

Magix's "unlimited creativity" boast is backed by content downloads from Movie Edit Pro 2015, 25 new editable templates, 20 new effect transitions based on new technology with blur presets, and complete broadcast capability. As it is a high-end product, it comes with a high-end price – £349 – but if this is your kind of level, head for **www.magix.com**.



Remember when Facebook wasn't around and when social networking was a new and fascinating thing, and services like Friends Reunited could actually charge people to send messages?

It really wasn't that long ago, but in a relatively short time, Facebook has grown exponentially, and it has found its way into seemingly every corner of the web. How often do you find websites have an option to log in using your Facebook credentials, rather than filling in a form?

Yes, it's convenient and it helps reduce the number of fake sign-ups to sites, but why is Facebook even allowed to vouch for you in this way?

The answer, of course, lies with the huge amount of information it holds about us and what it does with it. Of course, you might not have a problem with this arrangement, and that's fine – as long as you know exactly what you're getting yourself in for when you join its service. Sadly, though, all too many of us never stop to think about it.

See you next time…

Anthony

Editor

Meanwhile... On The Internet...

Live streamed direct from Anaheim, the opening of Star Wars Celebration pretty much took over the internet for a while last week. According to YouTube, there were about 50,000 other people streaming the show alongside us, as JJ Abrams and Kathleen Kennedy revealed more information about the eagerly awaited film (**tinyurl.com/MotI1359b**) as part of a frankly unholy amount of live coverage from the event (**tinyurl.com/MotI1359a).** Hint: skip to the JJ Abrams interview at about 1:23 (**tinyurl.com/MotI1359c**). While 50,000 may not seem like many, in the large run of things, the ripples the event made were huge. In the wake of the 20 minutes or so Abrams and cast members old and new were on stage, millions have watched the new two-minute trailer he introduced in a Steve Jobs-esque 'one more thing' (**tinyurl.com/MotI1359d**) moment at the end of the panel.

As you would probably expect, some parts of the web immediately began poring over the footage for clues to prove or disprove the many rumours surrounding the movie – not least our friends at *Den Of Geek* (**tinyurl.com/MotI1359e**) – while others went straight into meme-mode (our current favourite being the quite lovely 'Matthew McConaughey Reacts': **tinyurl.com/MotI1359f**), which pretty much sums up all the feels we were feeling as we felt them. Others still freaked out on their desire for their own BB-8, while we just want to know how the hell it actually works (**tinyurl.com/MotI1359g**).

The whole Star Wars streaming event we're talking about over there made us feel nostalgic, but not necessarily in the way you would expect: certain members of the Meanwhile team can remember sitting waiting for the *Episode III* trailer to appear on **Starwars.com** back in 2004, at a time when it still seemed a *little* bit like magic that you could watch a decent quality video file on your computer (they stayed late in the office because the connection there was fast enough to get the high-quality QuickTime file quickly).

If you want to feel really old, though, we'll just leave you with the fact that it is now 15 years since gruff metallers Metallica took on Napster over filesharing (**tinyurl.com/MotI1359s**). FIFTEEN YEARS. And the music industry still hasn't worked out how it feels about the digital file. Crazy, right?

However, while the *Star Wars* event was a masterclass in how to build hype for a blockbuster movie, the money behind *Batman vs. Superman: Dawn Of Justice* must have been in tears for a very different reason last week. In contrast to the way *The Force Awakens* trailer had managed to stay tightly under wraps in the run up to Celebration, that film saw its trailer emerge in possibly the worst way imaginable, via a shaky, dark and grainy bit of phone-shot footage overwritten by Spanish subtitles (no, we're not going to link to it).

Similarly frustrated will be the makers of *Game Of Thrones*, who have seen the first four episodes of the eagerly awaited season five turn up on torrent sites (**tinyurl.com/MotI1359h**). Still, that probably means that a few of the unlucky souls who won't live to see the end of George RR Martin's epic tale will see a little bit more than they perhaps would have (as mapped out here by Jerzy Wieczorek, a student at Carnegie Mellon in the States: **tinyurl.com/MotI1359i**).

The internet is a wonderful place, but not necessarily a kind one. It certainly is not a place where your mistakes can go unnoticed. Take, for instance, the friend of Redditor yllwsnow2, who – after a photo of his drunken handywork featured in r/funny (**tinyurl.com/MotI1359j**) – will for ever more be known as 'y'know, the guy who got wasted and tatooed himself REALLY BADLY'. Yes, his interpretation of Charmander from artist Vaughn Pippin's (aka 'Hatboy') 'Burton x PKMN' series of drawings (**tinyurl.com/MotI1359k**) now seems set to go down alongside 'Overly Attached Girlfriend' (**tinyurl.com/MotI1359l**), 'Ermahgerd' (**http://tinyurl.com/MotI1359m**), Tron Guy (**tinyurl.com/MotI1359n**) and the immortal Star Wars Kid (**tinyurl.com/MotI1359o**) in the long history of unfortunate viral image memes.

The whole thing is playing out as a successor to the 'left shark' thing that sprang out of this year's Katy Perry Superbowl show (**tinyurl.com/MotI1359p**), a very human, lovable, goof-up gone large (**tinyurl.com/MotI1359q**), but the whole thread is laced with concern for just how drunk/drugged the subject of the whole thing must have been to consider his artistic expression a good idea.

.AVWhy? Videos For Your Eyes... Not Necessarily For Your Brain

It's all about nostalgia this week, so what better way to finish all of this off than with a bit of The Hoff – and not just any bit of Hoff, but a slice of the new title track to the Kickstarter-funded 80s-fest *Kung Fu Fury* (**youtu.be/ZTidn2dBYbY**). It's got all the 80s things you'll be needing: synths, bad hair, bandana-wearing gangs in denim, Lamborghinis and a pumping anthemic melody. Feast your eyes and ears, my friends. Feast well.

Aaaaaaaand Finally...

Fancy a chance to explore the classic *Wipeout* tracks in all their glorious 90s detail? Yeah, thought you might. Well, pay a visit to **phoboslab.org/wipeout,** where Dominic Szablewski enables you to do just that. Find out more about how and why via *The Verge* at **tinyurl.com/MotI1359r**.

QUICK BITS... UK consumers will spend £53bn a year using mobile devices by 2024, according to research from Conlumino on

Caption Competition

It's caption time again, and this week we looking at what you've been cooking up for this culinary treat:

- **PlaneMan:** "Finally, Ramsay gets out swearead!"
- **bigdaddy:** "This is what the chef calls a recipe, but we don't take any notice; we just put in what's handy.
- **wyliecoyoteuk:** "That's really cool, a chopping board with moving pictures!"
- **...JBSee:** "I told you Jamie ses."
- **Dwynnehugh:** "Tweet her to say it's off the menu."
- **doctoryorkie:** "No backlight on your ereader? My assistant will provide carrots."
- **doctoryorkie:** "Banana Pi? Never heard of it!"
- **Thomas Turnbull:** "I asked for a chef's hat not a chef's app."
- **Thomas Turnbull:** "I bet I can beat your score on Candy Crush."
- **David Moss:** "Yeah, I've been cooking this new Android rom."
- **Quentin Beaumont:** "This thing's menus are even worse than ours."
- **Terry Martin:** "The latest way to get your technology souped up."
- **Bryan Hardeson:** "Chef, hold this while it updates because, ironically, I can't be bothered to wait."

Thanks to everyone who entered, but our winner this time around is "I wonder if these quad-core chips go well with fish?", courtesy of Tom Buckley.

To enter this week, head to the 'Other Stuff' section of our forum (**forum.micromart.co.uk**) and say something funny (but not too rude) about the picture below or email us via **caption@micromart.co.uk**.

Suspect Caught Thanks To Gaming Login

Homicide accused banged to rights after PlayStation play

A homicide case in America has moved forwards with a little help from the PlayStation Network. If this seems strange, let us explain...

The news comes courtesy of Pittsburgh's **TribLive.com**, where it's reported that a man from Pennsylvania was shot and stabbed to death last October. As it happens, the victim had a registered PlayStation console, a console that the killer used to log in to the PlayStation Network. When the IP address was traced, it led them to his house and they caught their man.

A strange case, no doubt.

US Blogger Imprisoned For Sick Son Scam

Horrible case

In a deeply upsetting court case in America, a woman has been sent to prison for 20 years for making her son sick, apparently so she could gain online attention. The horrendous case involved Lacey Spears putting salt into her son's feeding tube – an action that the court ruled ultimately led to her son's death.

Lacey tweeted and blogged about her son Garnett-Paul's illness, with prosecutors accusing her of enjoying the attention she received from writing about his medical problems, as well as from her family and doctors. The judge said that she wouldn't serve the maximum 25-year-to-life sentence that he could have imposed on her, though, instead handing her 20 years in prison.

Spears' lawyers immediately filed for appeal, but if they are unsuccessful she won't be eligable for parole until 2034.

Snippets!

Xiaomi Nabs Record

China's Xiaomi now holds the world record for mobile phone sales, besting the rest. Managing the "most mobile phones sold on a single online platform in 24 hours" – that's the official Guinness description – Xiamoi's totted up to 2.11 million device sales in a single day. The "single online platform" referred to is **Mi.com**.

Go China!

One Million Weekend Apple Watch Orders

Not massively surprising, this one: the Apple Watch is already proving popular, with pre-orders for the wearable coming close to a million on the first weekend of it being available to buy. The facts and figures come from Slice Intelligence, which estimated US consumers' interest based on a sample of e-receipts from actual shoppers. How much did they spend? Well buyers of the less-expensive Apple Watch Sport spent $383 per watch and those purchasing the standard Apple Watch spent $707. High demand means longer delivery dates, though, with some customers being told to wait until June for their new shiny wristwatches.

82 Seconds To Phish

A new report, put together by Verizon, has suggested that it takes a mere 82 seconds for cyber-criminals to bag a phishing victim. The wide-reaching document, reported by the BBC, is said to have analysed data from security incidents at thousands of companies last year and it found that affected companies took too long to notice phishing attacks, while the thieves were nabbing victims in a matter of seconds. The lesson is the usual one; take care when opening emails.

Linux 4.0 Is Here!

No major upgrade

Linus Torvalds has ushered in the age of Linux 4.0 via a post to the Linux kernel mailing list. The brief, and to the point, post notes that 4.0 "doesn't have all that much special" in terms of features (apparently, his preference is for numbering never to go beyond *x*.19, so this is better thought of as '3.20' than a significant milestone) and that it represents a "solid code progress" release, but he does also note that you can expect Linux 4.1 to be a big change when it comes out. It does, however, offer support for Intel's Quark systems-on-a-chip, improvements to Linux on the PS3, and live kernel patching and a other minor amendments.

WoW Introduces Real-For-Virtual-Cash Swap

Token system in US

It isn't everybody's cup of tea, but those who love *World Of Warcraft* really love it. If you are in that camp you may be envious of our North American cousins who can now take advantage of a new cash exchange system that's been brought in to enable gamers to buy in-game virtual gold for real-life money.

Previously, gamers had to visit dodgy grey-market websites in order to give themselves a boost online, but now that's all changed, meaning that gamers don't have to risk going about things that way. The new system allows players to buy a $20 "game time token" in order to purchase 30,000 gold coins to spend in the online world.

The dollar exchange rates fluctuated somewhat during the first couple of days of this going live so some gamers received a lot more gold coins than others, but in principle this is a system that should surely be applauded. We somehow suspect that the grey market will continue to run alongside, but Blizzard can't do much about that, really.

Turing's Notebook Sells For A Million

Enigma code genius remains popular figure

Among the items on sale in a recent auction that took place at Bonhams, New York and was a notebook belonging to the great Alan Turing. Unsurprisingly, said book – which contained handwritten notes made by Turing during his time at Bletchley Park in the 1940s – attracted a lot of interest, so much so in fact that it eventually sold for over a million dollars to an unnamed buyer.

Actually, the final amount paid for the 56-page book, which was among papers Turning left to mathematician Robin Gandy in his will and included notes on computer science and mathematical notations, was $1,025,000. It was the highlight of an auction that also saw the sale of actual Enigma machine, though that went for far less than the one-of-a-kind notebook. Wonder what a pristine copy of the first issue of *Micro Mart* would go for? In fact, don't answer that...

Chess Player Disqualified Over iPod Scandal

Cheats never beat

Who knew that chess was such a scandalous pursuit? *The Telegraph* has reported that a grandmaster, no less, has been thrown out of an international competition because he was allegedly found to have been using an iPod to cheat.

How did he use the iPod so blatantly? He is reported to have sneaked it into the toilet, by all accounts – but, eventually, his frequent cubicle trips raised questions from his opponent at the event in Dubai. When event referees were informed, the iPod Touch and a set of headphones was found in a cubicle, with a chess app running on it.

Said grandmaster, who denies that the iPod is anything to do with him, is now facing investigation by the World Chess Federation, with the worst-case scenario being that he can't compete for 15 years.

Blimey.

Chromebook Pixel 2 Comes To UK

It'll cost you £799

Media reports suggest that the next iteration of Google's Chromebook Pixel should be available to buy by the time you read this. The high-end netbook features an Intel Core i5 processor, 8GB RAM and 32GB solid state storage and will cost £799 according to the Google Play store. A higher-spec version featuring an Intel Core i7 chip, 16GB RAM and 64GB SSD was also available for pre-order at the time of writing for £999.

Expensive, then.

MS Office Online Ups Dropbox Integration

Direct edits from web browser

Microsoft has extended its relationship with Dropbox by providing access to documents via Office Online. With Windows already providing Dropbox access, plus Windows Phone users already benefitting from Dropbox integration, this seems a sensible and relatively obvious move from Microsoft, which announced the news in a blog post.

"Now, when working in Office Online you can add your Dropbox account to easily browse, open and edit Office files with Office Online. You can also create new files in Office Online, and save them directly to your Dropbox."

Essentially, then, Microsoft users can access and edit Dropbox docs at home, on the move or directly via their web browser. No excuse not to get that report in on time now...

Netgear EX7000-100UKS Nighthawk Wi-fi Range Extender

Another Nighthawk device has flown the coop from Netgear

DETAILS
- **Price: £126.34 (Scan)**
- **Manufacturer: Netgear**
- **Website: www.netgear.co.uk**
- **Required spec: 2.4 and/or 5GHz 802.11 a/b/g/n/ac wi-fi router or gateway, Upto to date browser**

The last Netgear Nighthawk hardware I saw looked like it was inspired by Darth Vader's Imperial Transport. Thankfully, those aesthetics have been toned down somewhat in this new EX7000-100UKS wi-fi range extender.

It retains the wedge profile, but the three antennas are less wing-like. But the EX7000-100UKS is much more about what is inside, and that's pretty impressive on paper.

Built around Broadcom's 1GHz BCM 4708 dual-core processor, this unit is rated to AC1900 by combining 600Mbps on the 2.4GHz range and 1,300Mbps on 5GHz.

Wired Ethernet is gigabit, and Netgear provides five ports of that, making the EX7000-100UKS a local switch, among its other virtues.

Those include the ability to operate as an access point instead of an extender, and as a media and print sharing device via a single USB 3.0 port.

It was tempting to look at this hardware and assume, wrongly, that it's just the EX7000 Nighthawk router, with a different case and firmware, but it isn't.

The critical hardware feature is a 700mW high power amplifier that through the web interface you can configure to four different output levels.

I haven't seen this before, and according to Netgwear on the highest power band, it can cover an area of 930 meters square. That's great, for those with big properties, but it's also useful if you don't want your signal leaking onto a neighbour's.

One problem I've experienced with extenders and repeaters generally is that their communication with the router tends to tread on the service it's attempting to provide to the local client. The solution is called 'Fastlane', and it configures the two connections on different lanes, allowing them to happen simultaneously without interference. At least that's the theory.

In testing, this assertion seemed well supported, as this is one of the quickest extenders I've ever tested. I've come to expect the real performance to be on the 2.4GHz bands, but the EX7000-100UKS delivers well over 170MB/s using 5GHz at short range. Even outside my home it managed more than 100MB/s, amazingly.

The overall performance and range puts Netgear's previously released EX6200 firmly in the shade, as well as anything I've tried from other manufacturers for that matter.

It's also reasonably easy to set up, if you understand the difference between an extender and an access point. And Netgear has built a rather handy Android tool, the WiFi Analytics App, which you can download for free to help you get the best out of it or any wi-fi hardware.

I have only two complaints. The first is the normal one about wi-fi hardware that includes a USB 3.0 port, when it can't support the speed of that interface. And the other is the size of the EX7000-100UKS, which at 25cm high and 20cm wide isn't something you can easily hide. A more discrete device would be preferable but not to sacrifice performance.

It also isn't a cheap item, but in this situation you most certainly get what you pay for – that being wi-fi extended the way you want it.

mm Mark Pickavance

Exceptionally fast and very useful wi-fi extender

OneClick Intelliplug AVC014

Mark celebrates the return of the even smarter Intelliplug

DETAILS
- **Price: £29.95**
- **Manufacturer: OneClick Power**
- **Website: www.oneclickpower.com**
- **Required spec: Mains electrical power**

Way back in late 2006 I reviewed the original OneClick Intelliplug and called it "A simple but effective means of electrical power control."

What it did was provide a means to slave the power of one device to others, so that when you turned off your PC, for example, all the peripheral devices had their power chopped too.

However, a couple of years later, I ran into problems with my Intelliplug, because as my PC became more power efficient, it started thinking it was turned off when I was still using it.

The new AVC014 design addresses that issue, comprehensively and also adds some other clever twists to make it even better at saving power.

Comparing it to the original, the AVC014 is almost identically sized and shaped, though the sockets have now been redefined. The original had one master and two dependent sockets, and this has master, slave and 'Always On'.

It's a minor change, but if you hang a gang socket off the slave and Always On outlets, then you can cover any eventuality.

On the underside is now a small rocker switch that is related to what looks like an RJ12 telephone style socket on the side. Here you plug a remote infrared sensor in, and the rocker sets if the sensor controls the master socket or is always live.

> "You can tailor its operation to very exacting conditions"

Initially I wondered if the sensor detected body heat, but actually what it does is detect the infrared signal put out by any remote control. Using any remote will activate power to the Master socket, allowing a TV to be turned off entirely but still powered back using a remote.

As clever as this is, under EU regulations, all modern TVs must consume less than 1W in standby, so turning it off entirely will probably only save you less than a fiver a year.

The more useful use for the RJ12 socket is as a means to connect the AVC014 to a PC, using the Customisation Kit AVCP01 (£9.95).

Using this special cable, the device can be connected to a PC's USB port and do lots of interesting things if you're running Windows 7 or later.

Included in this extended repertoire is the ability to monitor power consumption, obtain collective power readings, pair remotes to the sensor and define activity timers.

But by far the best feature – and the one that fixes directly the problems I experienced – was an ability to fix a specific power threshold for the Master Socket, below which the slave outlets are disabled.

This makes the AVC014 significantly more useful than a general purpose smart plug, as you can tailor its operation to very exacting conditions.

The flipside of that coin is that where the original Intelliplug could be found for less than £20, this is at least another tenner, and with the AVCP01 it's double the cost.

In the right situation, this device could earn its cost back in a reduced electricity bill, but exactly how long it would take to do that depends on how intelligently you use it.

mm Mark Pickavance

The Stephen Hawking of intelligent power plugs

Celestron NexStar 5SE GoTo Computerised Telescope

Viewing the universe has never been easier or as much fun

DETAILS

- **Price: ~£569**
- **Manufacturer: Celestron**
- **Website: goo.gl/9coQPR**
- **Required spec: Windows XP or later, Mac OS X, 8xAA batteries, serial-to-USB cable (optional)**

EDITOR'S CHOICE micro mart

We had a group test recently on computerised telescopes and how they have now matured into almost mini-home observatories. A modern GoTo telescope is an extraordinary device with the ability to connect to a computer regardless of the operating system, to allow the user a greater degree of control and to upgrade the scope's abilities when necessary.

For the amateur astronomer, you won't find much better than the offerings from Celestron, in particular this model, the Celestron NexStar 5SE. This is a Schmidt-Cassegrain telescope with a 125mm objective diameter and a focal length of 1250mm. The Schmidt-Cassegrain element describes the corrector plate at the front of the telescope, where light is focused by the primary mirror, together with a smaller convex mirror located in the centre of the corrector plate. In essence, this means you'll get a better focal length in a compact design.

Speaking of which, this is a remarkably lightweight setup, including the tripod. The entire package weighs just under 8kg, and the mount can be removed from the tripod by unscrewing three bolts located underneath the top of the tripod. This of course means you'll easily be able to move the telescope to a remote location, should you so wish.

> **"For the amateur astronomer, you won't find much better"**

The 5SE comes with a 25mm eyepiece, which will give a magnification of around 50x. It's enough to see Jupiter and several of its moons on a clear night, as well some rather magnificent lunar observations and views of the inner planets. There's also a finderscope with a red LED dot projected in the centre to help align the telescope.

The computerised handset supplied is a Celestron NexStar+, a device that on its own can activate the motors to align the telescope to 40,000 objects in its database. Alignment is a simple enough affair, thankfully. All you need do is fit the eight AA batteries, power up the handset and start by entering the current time, date and your location either by the selecting the closest city or by entering the exact latitude and longitude. Once the basic information is entered, you can choose to align the 5SE in a number of ways. The Single Star align is quick and gets you up and running in minutes but is less accurate; the two-star align is far more accurate but takes a little longer. You can also auto-align or align using planets. Suffice to say, it's a comprehensive setup and thankfully all documented in the instructions.

The handset, though, has a few more tricks up its metaphorical sleeves. By connecting the accompanying RJ-11-to-serial cable to a PC, using the PCs serial port or a good serial-to-USB adapter, you can remote control the 5SE, update the firmware installed on the handset or use a third-party product such as Stellarium to greater improve the object database currently stored. There are even ports on the mount itself that can be used to connect a GPS module and an added camera control port.

We had no trouble connecting and communicating with the 5SE in Stellarium; it was a simple matter or loading the right GoTo script and setting the relevant COM port. Likewise, updating the firmware on the handset is conducted through a Java-based program that's both available on the Celestron website and on one of the three CDs. In this case, the 5SE was instantly found, and the latest firmware was downloaded, ready to be installed at a click of a button.

The trio of CDs that come with the 5SE include a PDF version of the manuals and instructions, TheSkyX First Light Edition astronomy software and NexRemote remote control software – all of which are compatible with Windows and Mac. The remote control software, once installed, will display a virtual handset identical to the one on the 5SE on the screen. From here you can control the telescope from the PC or laptop, without using the handset. But it also adds a text-to-speech function, which will talk you through the text displayed on the handset and provide any other information necessary.

The supplied software is certainly good enough for the task at hand and is simple to use. However, we felt that better control and a better astronomy software was already available with Stellarium. Plus Stellarium can be used on any OS, and thanks to the scripts already written for it, it can offer a better degree of remote control over the telescope.

Naturally, there are many other options and abilities the Celestron 5SE offers. You can attach a camera for astrophotography or a special webcam with a 1.25" fitting for filming astronomical events. And with the right hardware in place, you can control the telescope from virtually anywhere. In one instance, we connected the 5SE to a Raspberry Pi and left it outside while we retired to the warmth of our PC and opened a remote desktop session.

The Celestron NexStar 5SE is an excellent telescope, and the added benefit of its computerised functionality makes it even more alluring to both keen astronomers and computer enthusiasts alike, especially when combined with the right software. There's plenty to see and experiment with, and it would make for an ideal project and hobby for years to come.

mm David Hayward

Ideal for the technical hobbyist and those looking for an interesting project

Amazon Fire TV Stick

Can this streaming device fire its way to the top?

DETAILS

- **Price: £35**
- **Manufacturer: Amazon**
- **Website: www.amazon.co.uk**
- **Required spec: TV with HDMI port**

Amazon has a long history of releasing hardware in the US first and making the rest of the world wait. It did it with the Kindle, the Kindle Fire, the Fire TV and now it's done it again with the Fire TV Stick. Released in the UK on 15th April, it's actually been available to Americans since November last year. Still, better late than never, we suppose.

But what does it actually bring to a party that already has Google's Chomecast and the Roku Streaming Stick as guests of honour? Can it be the one everyone wants to be friends with, or will it be universally shunned, before slinking off home early?

Well, if you've seen or used its bigger brother, the Fire TV set-top box, then you might have a fair idea of how this one performs. It is without doubt an excellent piece of hardware for a great price (made even better if you benefited from one of the preorder deals, which made it as cheap as £7).

Like the Roku and the Chromecast, it looks like an oversized pen drive, with an HDMI connection at the end, rather than USB, and you simply plug it into your TV and connect it to the mains via the micro-USB power port. Once up and running, you should find that it comes pre-registered with your Amazon account details (although there is the option to change this), and one you've set up the wi-fi connection, you're taken to the main menu.

There, you're greeted with tiles. Lot of tiles. And down the left is a menu of options, each of which leads to more tiles. This is certainly a visually appealing approach, reminiscent of Windows 8, making it a good way to show off movie, TV and music artwork, but it's not particularly efficient. It would have been helpful to have an option to view items as a text list, with perhaps a preview box showing up when you highlight something.

Putting this minor criticism aside, the general operation of the Fire TV Stick is straightforward but impressive. For such a cheap product, this heavily customised version of Android looks slick and runs well, which is no doubt helped along by the dual-core ARM processor and dedicated graphics. We did experience the odd bit of lag and

Specifications:

- **Size: 84.9 x 25.0 x 11.5 mm**
- **Weight: 25.1g**
- **Processor: Broadcom Capri 28155, dual-core 2xARM A9**
- **GPU: VideoCore4**
- **Storage: 8 GB (actual formatted capacity will be less) available for apps and games**
- **Memory: 1 GB**
- **Wi-fi Connectivity: Dual-band, dual-antenna wi-fi (MIMO); supports 802.11a/b/g/n wi-fi networks**
- **Bluetooth: Bluetooth 3.0 with support for HID, HFP, SPP**
- **Game Controller Support: Yes, optimised for Amazon Fire Game Controller, compatible with Nyko PlayPad Pro and other Bluetooth controllers**
- **Cloud Storage: All Amazon Cloud Drive customers start with 5GB of free storage**
- **Ports: 1 Type A HDMI 1.4b output, w/HDCP 1.4**
- **1 micro-USB for power only**
- **Audio: Dolby Digital Plus certified, audio pass through up to 7.1**
- **Content Formats Supported**
- **Video: H.264**
- **Audio: AAC-LC, AC3, eAC3 (Dolby Digital Plus), FLAC, MP3, PCM/Wave, Vorbis**
- **Photo: JPEG, PNG, GIF, BMP**
- **Output Resolution Supported: 720p and 1080p up to 60fps**

even a couple of short freezes, but for the most part, we were able to get around quite easily and find what we wanted.

This was made all the more easy once we'd downloaded the free Fire TV app for our smartphone, because although the included remote control is fine for clicking through menus, its lack of keys makes text entry a chore. With the app, you don't have to use the stick's clunky on-screen keyboard; you can instead use voice search or your phone's keyboard. You could also consider buying the official Amazon voice remote, but that will set you back a further £25.

No matter you locate what you want to play, once you do, you shouldn't be disappointed with the quality. High-definition video plays fluidly, without any stuttering and, if you have the correct equipment, you'll also find it outputs surround sound using Dolby Digital Plus.

As great as this all is, though, before before buying this device, you should be aware of how eagerly it tries to push you into buying more stuff from Amazon. That's to be expected, maybe, but it's still annoying. Most of the categories in the menu (Movies, TV, etc.) display only Amazon content, and if you want to see things like Netflix and the BBC iPlayer, you need to head to the Apps section to launch them.

Fair enough; they're are competitors, after all. But what's less fair is how difficult Amazon has made it to side-load apps and then launch them. You need to download .apk files for apps and then use third-party software to get them on the Fire TV Stick. And to make matters worse, once installed, they don't even appear in the Apps section; instead, you have to head to Settings > Applications > Manage All Installed Applications and then launch the app. Every single time.

If you're heavily invested in the Amazon ecosystem, then this might not present much of a problem to you, but if you'd prefer something that offers more freedom, then the Roku might be the better option. You might even be better served by the Raspberry Pi and an installation of OpenELEC, but that involves a lot more setting up, and certain services like Netflix aren't available for it.

Regardless of what the competition offers, though, the fact remains that for £35, you get a tiny streaming media device that can quickly turn any TV into a smart TV. It might not do everything it possibly could do, but what it does do, it does well and without any kind of fuss or complications.

mm Anthony Enticknap

A bit limited, but excellent value nonetheless

Mydlink Home Monitor HD

D-Link adds an even more interesting device to its Mydlink Home range

DETAILS
- **Price: £74.62 (Ebuyer)**
- **Manufacturer: D-Link**
- **Website: www.dlink.com/uk/en/**
- **Required spec: Wireless router (802.11n) with an internet connection, iOS or Android platform**

Key Features:

- **1/4" megapixel progressive CMOS sensor**
- **5 metre IR illumination distance**
- **Minimum illumination: 0 lux with IR LEDs on**
- **Built-in infrared-cut removable (icr) filter module**
- **4x digital zoom**
- **Lens: Fixed length 2.38mm**
- **Aperture: F2.4**
- **Angle of view: (H) 78.44°, (V) 47.9°, (D) 85.98°**
- **Minimum object distance: 434 mm**
- **Exposure Time: 1/7.5 to 1/24,000 sec.**
- **Built-in microphone**
- **Video resolutions: 1280 x 720, 800 x 600, 720 x 480, 640 x 480, 320 x 240 at frame rates up to 30 fps**
- **Wi-fi: 802.11b/g/n/ac wireless with WEP/WPA/WPA2 encryption**

A few weeks ago, I covered the D-Link Mydlink Home Smart Plug, and almost immediately it sent me more of this range to explore, including this surveillance camera.

The DCS-935L or 'Monitor HD' is much like a dozen other 720p web cameras that I've seen in the past few years on one level. A significant number of them are made of shiny white plastic, can be wall mounted or free standing, use a USB power supply and offer a fixed focal length lens.

To get it operational, the process is pretty much identical to all the other Mydlink Home gear, in that you use a QR code printed on it (and on the documentation) to identify it to the Mydlink application on a phone or tablet.

> **"Pretty straightforward, and the picture quality is surprisingly good"**

Once the app has that information, it can relay the wi-fi access point details you'd like it to connect to, and from that point onwards you can access it either through your phone/tablet or via the Mydlink portal website.

Where this is better than some of its other Home automation products is that the web interface gives as much control over the camera as the mobile apps, allowing you to configure if it is motion or sound activated and when you'd like it active.

It's all pretty straightforward, and the picture quality is surprisingly good, even if you're accessing it over the internet.

Those interested in the security options will be encouraged by the inclusion of an IR emitter allowing it to see up to five metres in the dark and exposure compensate for variable light levels in the daytime.

But these capabilities can be bought for less, and something like the Logitech B525 HD Webcam, for example, costs about £40. That begs the immediate question as to why this would be worth more when technically it isn't that remarkable?

On its own, the DCS-935L is something of a tough sell, but if you own other D-Link hardware, then it suddenly starts looking much more interesting. As part of this Mydlink Home range, you can build rules that allow the camera to either trigger other devices, like the Smart Plug, or be triggered by the motion sensor, for example.

How complicated you'd like to make the interaction is up to you, but the camera can be instructed to become active and record sound and video under an almost infinitely complicated set of circumstances.

However, as clever as that is, I'm also happy to accept that not everyone is a hopeless geek or has the time to construct elaborate interactive home environments.

Alone, the Monitor HD is interesting, but it requires greater investment in extra equipment to truly reach its full potential.

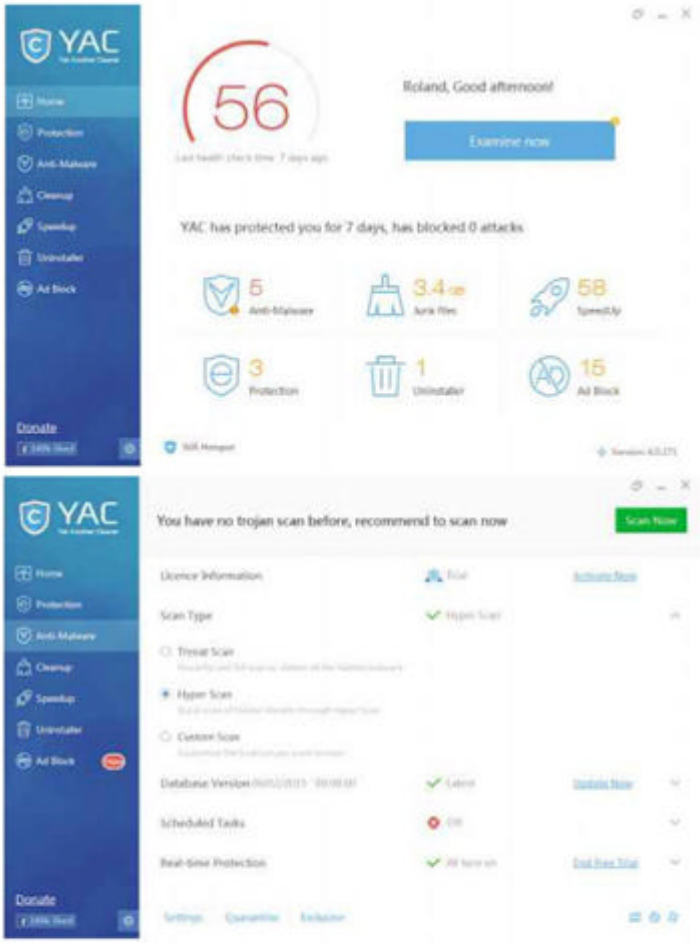
mm Mark Pickavance

A HD surveillance camera with automation bells and whistles

YAC 6.0

Clean up, tune up and protect your PC from malware with YAC. Roland Waddilove tests this popular tool

DETAILS
- **Price: £20.50**
- **Manufacturer: Elex do Brasil Participacoes Ltda Technology**
- **Website: www.yac.mx**
- **Required spec: Windows XP or later, 1GB RAM, 1GHz processor, 155MB disk space**



YAC stands for Yet Another Cleaner, and it's one of many clean-up and tune-up utilities for Windows PCs. YAC is different to rivals, though, because when the free tool is downloaded and installed, there's an option to include YAC Anti-Malware Premium. This costs $29.99 for three PCs, which works out at around £7 per PC.

The clean-up tools included in YAC include the usual system and software junk files that build up on the disk drive and the settings in the registry. There are several levels of registry cleaning, depending on how aggressive and risky you want to be, such as 'Cleanable registry' versus 'Cleanable registry with caution'.

Privacy clean-up functions enable you to erase your web browsing history and various Windows and commonly used applications histories. It looks for concealed services, potentially unwanted programs and registry left-overs, and it scans for malicious plug-ins and potentially unwanted ones. It automatically works with Internet Explorer, Chrome and Firefox. Some suggestions were wrong, and useful browser extensions like LastPass could be removed if you did not check the scan results and modify them before cleaning. It presents a list of categories of items rather than individual ones, so you can select or deselect categories like the Windows Run box, Windows Media Player, Flash cookies and so on.

The Speedup module optimises the system by analysing the programs and services that run on start-up, and it makes a few tweaks to the system such as disabling error reporting, debugging, autoplay and a few more. I wasn't completely happy with every suggested tweak, but everything is presented as tick boxes to enable you to choose what to optimise.

It is not clear how far the malware protection extends, and it's hard to tell whether it's a complete replacement for regular security software or just an addition. It seemed to work okay alongside my free anti-virus software. YAC Premium includes real-time protection that can be turned on or off, and this is mostly related to web browser functions. For example, it automatically detects when you download a file, no matter where you save it to, and scans it for malware. A message pops up stating whether it's safe or not. It can detect malicious websites, and it prevents the browser going there by displaying a warning that malware lies ahead, so you can avoid it and go elsewhere.

The Anti-Malware module scans the disk for malware like adware, spyware, viruses and so on. There's a quick scan, a very quick scan and a custom one that enables you to select any disk or folder. Any malware discovered is listed and can be selected and removed. Scans can be scheduled too. Each web browser's home page can be locked, the search engine can be locked, and malicious plug-ins are blocked.

This is a clean-up utility with useful extras like security, an uninstaller, ad blocker and browser protection, but more information about the extent of the security and its effectiveness is needed before I would trust it on its own without other security software. As with other cleaners, YAC can clean too much, so you do need to take care. Used with caution, it is good.

mm Roland Waddilove

> **"More information about the extent of the security and its effectiveness is needed"**

A useful clean-up tool that has malware protection too

GROUP TEST

Touchscreen Laptops

Like it or not, touchscreen laptops are here to stay, and they have some pretty alluring specs to go with the ability to swipe, tap and pinch your way through the operating system and installed programs.

David Hayward gets his hands on six touchscreen laptops, and mauls them into submission to find out which are worth spending your cash on.

Touchscreen Laptops

Asus N550JK

DETAILS
- **Price: £750**
- **Manufacturer: Asus**
- **Website: goo.gl/6tecJi**

Asus has, in our opinion at least, upped its game in terms of the quality of its laptops in recent years. To be fair, they were always fairly good, but they did tend to lean toward to the cheaper side of the laptop quality scale.

The N550JK, however, couldn't be further from that remark. This is an impressive-looking laptop with a 15.6" 16:9 IPS full HD LED, backlit laptop with a ten-point multi-touch display. It's powerful too, being a gaming laptop and boasting a choice of either Intel Core i5 4200H or Intel Core i7 4700HQ processors, up to 16GB of DDR3L 1600MHz memory, a 2GB Nvidia GeForce 850M and a 1TB hard drive.

Beyond the core components, the N550JK also features a 3-in-1 card reader, HD webcam, DVD/RW optical drive, HDMI and VGA out, three USB 3.0 ports, gigabit Ethernet, 802.11 b/g/n wi-fi, and Bluetooth 4.0. Audio quality is handled by four built-in speakers and powered by Bang & Olufsen ICEPower drivers.

The model we tested featured the i7 4700HQ CPU at 2.5GHz with a 3.5GHz boost and 8GB of memory; needless to say, it was very fast indeed. The touchscreen worked fantastically and was extremely responsive in Windows 8.1. As for gaming, there wasn't much the N550JK couldn't handle. It certainly played through our sample collection (consisting of *Elite: Dangerous*, *Borderlands 2*, and *Watch Dogs*) without any signs of lag or dropped frames.

The design of the N550JK isn't too bad either. It certainly looks good enough, with its silver keyboard section and darker, brushed aluminium effect lid. But it's the keyboard design that makes it stand out, with more aluminium used to encase the high-quality keys and touchpad. Overall, the effect is splendid.

However, despite the good looks and ample performance, there were a couple of points that could do with being addressed. For one, this isn't a light laptop. At around 2.7kg the Asus N550JK will probably cause you to have one or two aches at the end of the day, should you be carrying it around. Secondly, we found the 1TB drive a little noisy under load. Perhaps using the 1TB as a secondary drive with an SSD as the primary would quieten things down a bit and speed up boot and launch times. Or maybe a decent hybrid drive, perhaps?

Still these are fairly minor quibbles on an otherwise very good laptop. The sound quality is superb, the gaming and overall Windows performance is as good as any power user desktop, and it looks the business too.

Interestingly, we expected the Asus N550JK to top the £1,000 mark, but we were quite surprised to find that the model we were testing averaged out at around £750, depending on where you shop. £750 is still a fair amount of cash, but on the whole, and considering what you're getting here, it's not a bad price.

Acer Aspire V3-112P

DETAILS
- **Price: £249.99**
- **Manufacturer: Acer**
- **Website: goo.gl/c6xgaE**

Acer is another company that has since improved dramatically the quality of its laptop range over the last few years. Where once you may have found the majority of its range at the budget end of the shelf, these days an Acer laptop can span the entire row and still deliver good all-round quality.

The Acer Aspire V3-112P is toward the lower end of the scale, an entry-level type laptop that has an 11.6", 1366 x 768, Active Matrix TFT LCD ten-point multi-touch screen. It's powered by an Intel Celeron N2840 dual-core processor running at 2.16GHz with a turbo boost of 2.58GHz. There's 2GB of DDR3L memory, an Intel GPU and a 500GB hard drive, on which you'll find a copy of Windows 8.1.

You'll also find 802.11 b/g/n wi-fi, gigabit Ethernet, Bluetooth 4.0, a single USB 3.0 and a USB 2.0 port, HDMI out, HD webcam and an SD card reader. It's also available in a few colours: silver, blue and the one we had to test, a rather gaudy pink.

Colours aside, the design of the Aspire V3-112P is okay. It's a small, portable laptop with a nicely spaced keyboard sunk into the aluminium case, with the similar coloured brushed aluminium effect lid sporting the Acer name logo. Disappointingly, though, the colour scheme is dropped around the screen bezel, which makes it look a bit more like a toy than a proper laptop. Generally it's easy to carry, weighing just 1.4kg, and when powering up from standby it can spring into life fairly quickly.

It's not the most responsive laptop we've ever tested, though. Waking up from standby, as we just mentioned, feels sprightly enough, but from cold it seems to take an absolute age to get up and running. When in Windows 8.1, occasionally the screen appears to need to catch up with itself, especially if your swiping, tapping and so on with a will. Granted, you won't always be utilising the full ten-point touch aspect of the screen, but it did struggle when we put it through its paces.

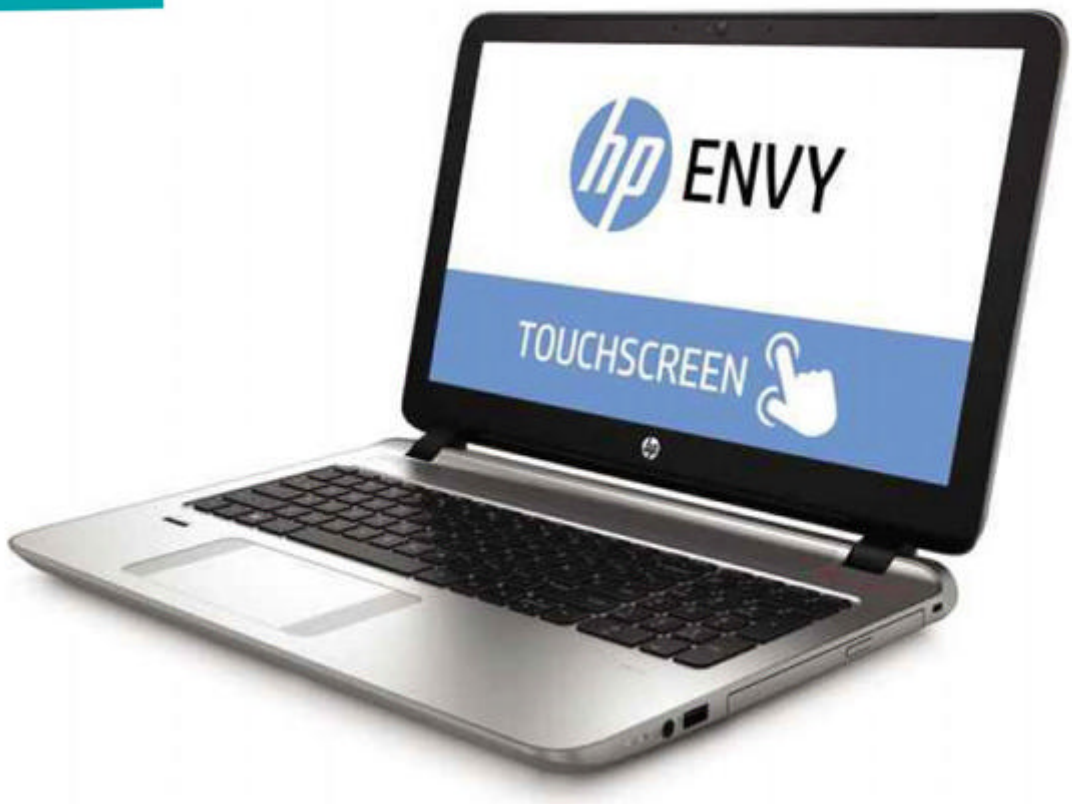
As with the previous laptop, we're left thinking that the inclusion of an SSD would have greatly improved the overall performance of the entire system. Mind you, this is a £249 laptop, and part of its appeal is the fact that it's fairly cheap, light and manageable, and available in a range of colours. It's ideally suited for a younger person for school or college work, or as one of those laptops you keep tucked down the side of the sofa for looking up random snippets of information now and then. However, we'd be willing to pay an extra £50 for an SSD instead of the traditional 500GB spinner..

On the whole, the Acer Aspire V3-112P isn't all that bad. It looks okay, and it'll suit most light-weight processing tasks well enough, with the added benefit of it having a touchscreen. All in all, an okay buy for someone who requires very little computing power.

micro mart
Quality 7
Value 7
Overall 7

HP Envy 15-k252na

DETAILS
- Price: £899.95
- Manufacturer: HP
- Website: goo.gl/5Sye3v



The HP Envy 15-k252na is an impressively specified power user's laptop. It's powered by a 2.4GHz Intel Core i7-5500U, 12GB of DDR3L memory, a 4GB Nvidia GeForce GTX 850M, a 1TB SSHD and an 8GB flash cache memory module. The screen too is equally impressive, with a full HD, multi-touch 15.6" WLED backlit panel that's fast and very responsive within Windows 8.1.

Other specifications include 802.11 a/b/g/n/ac wi-fi, Bluetooth 4.0, gigabit Ethernet, an accelerometer, HDMI out, three USB 3.0 ports, DVD-RW and an SD card reader. The audio quality rivals that of the Asus model, with the Envy 15-k252na using a BeatsAudio built-in speaker setup, complete with a reasonably powerful subwoofer.

The design is fairly standard, considering the emphasis on the internal specifications. It's not an ugly setup or something that looks desperately outdated; it's just fairly bland. The solid silver effect throughout is a tad cheap and plasticky looking, but the full-sized keyboard with number pad is good. Plus this another rather heavy laptop, weighing roughly 2.7kg.

Performance is certainly good, but here we have a bit of an issue with the pre-installed programs and applications, which HP assumes are needed. While on the whole good, we did find that the likes of Avast! SecureLine VPN, McAfee LiveSafe, Booking.com, TripAdvisor and Foxit PhantomPDF Express for HP tend to combine to take the lion's share of the system resources. We're sure someone, somewhere will be happy with these, and many more included apps and programs, pre-installed, but in our view they simply take up valuable resources from the system.

> **"The solid silver effect throughout is a tad cheap and plasticky looking"**

The combined effect with everything that was pre-installed running really dragged the system, and there were times when swiping from one Windows 8.1 screen to the next staggered under the weight of everything else that was going on. Having said that, once we removed a large portion of the offending programs, the Envy 15-k252na sprang into life and performed magnificently.

One other point that's worth mentioning is the cost. While this could easily stand toe to toe with the Asus n550jk, you will be paying £899.95 for that privilege.

Although the HP Envy 15-k252na is a laptop with processing and memory muscle to spare, the added weight of the pre-installed programs and the rather high price make it somewhat less appealing than the Asus.

If, however, you're a staunch HP user and you have £900 pounds going spare, then this will certainly be a laptop worth looking into.

Toshiba Kira 13.3

DETAILS
- **Price: £1,199.95**
- **Manufacturer: Toshiba**
- **Website: goo.gl/Yp4umm**

When Toshiba gets an idea in its head, it certainly goes at it with a will. Take, for example, the Toshiba KIRAbook range, which promises elegance, power and, according to HP, perfection.

The HP Kira 13.3 is certainly a stylish-looking laptop, one that could even draw envious glances from MacBook Pro owners. The 13.3" screen may sound small, but it manages to pack in a ten-point multi-touch, WQHD 2560 x 1440 LED, PixelPure panel. Together with this quite luxurious screen is an Intel Core i7-5500U processor at 2.4GHz, with a 3GHz turbo boost, 8GB of 1600MHz DDR3L memory, a mobile Intel HD5500 GPU, and a 256GB mSATA SSD with Windows 8.1 pre-installed.

You'll also find Intel dual-band wi-fi with Bluetooth 4.0, HD webcam, HDMI out with 4K UHD support, a pair of USB 2.0 ports with a single USB 3.0 port and an SD card reader. Sadly, due to the slim nature of the Kira, there's no Ethernet or optical drive, but Toshiba has managed to squeeze in a decent set of Hardman Kardon speakers somewhere in there.

The design of the Kira is simply splendid. The smart, brushed aluminium finish with a magnesium alloy chassis is sheer eye-candy for those who prefer to have their technology with a sense of style. It weighs just 1.35kg and is slightly less than 20mm thick, but the icing on the cake is that this isn't a laptop that's just pretty – it can perform too.

> **"Really you're just paying for its compact size and weight"**

We've had a few super light-weight touchscreen laptops in the past, and while good most seem to compromise on performance, thanks to the combination of a decent process, fast memory and the SSD though, the Kira springs into life within seconds and can take pretty much anything you decide to throw at it. In terms of gaming, though, it's not the best, but for normal, day-to-day duties and for something that needs a little more demanding processing than usual, this fits the bill nicely.

It feels good too, without a hint of cheap plastic anywhere. And the keyboard is well positioned and spaced out for fluid typing without the feeling of being cramped inside a small laptop chassis.

There's really only one major issue we have with the Kira, and it's one we think you'll appreciate; it's that it costs in the region of £1,199.95. You could probably find one slightly cheaper if you shop around, but not by a huge amount. Those of you who have a couple of thousand going spare may not blink at spending that amount on a laptop, but to most folk this is a rather hefty chunk of the annual housekeeping, so it's something of a turn-off.

Really you're just paying for its compact size and weight, as well as the Mac-like style. For nearly half the price of the Kira, the Asus can beat it in a performance head to head, and you'll also get to play the latest games on the Asus.

So although a great laptop, the Toshiba Kira 13.3 is just a little too expensive to justify.

Zoostorm Notebook 3310-3151

DETAILS
- Price: £235
- Manufacturer: Zoomstorm
- Website: goo.gl/qFQLQE

Zoostorm is one of those companies that are often dropped from consideration purely due to the fact that it's not a well-known brand. True enough, it has produced some fairly low-quality products in the past, but it can't all be bad, can it?

The Zoostorm Notebook 3310-3151 has a 14", 1366 x 768, 16:9 multi-touch LED panel, together with a 1.6GHz Intel Celeron 1037U, 4GB of DDR3L 1333MHz memory and a 500GB hard drive, on which you'll find a pre-installed copy of Windows 8.1.

You'll also find three USB 2.0 ports, HDMI out, 10/100 Ethernet, VGA and a 9-in-1 card reader. Wi-fi 802.11 b/g/n, Bluetooth 4.0, a HD webcam and mini card slot complete the main hardware specifications.

In terms of design, you could say that this is an extremely dull-looking laptop, but in all honesty, it's simply functional, if a little grey. Having said that, though, there is the pervading sense of cheap plastic used throughout the entire laptop, which is a little disappointing. On the plus side, the keyboard is really very good and felt quite fluid and responsive to type on for a reasonable length of time.

Performance is patchy, though. Boot-up times were slow, and when in Windows 8.1, the touch functionality felt very sluggish and at times failed to respond to the first touch, swipe or tap. For the more mundane tasks of browsing, responding to emails and typing something out in a Word document, the laptop was fine, although it took an age to launch anything. When we needed to ramp up the processing power for something, though, the Zoostorm struggled and often refused to play at all.

It's not the world's most powerful performing laptop, that much is evident, but there's something else here that makes this laptop underperform drastically. Unfortunately, we couldn't find what it was, but we suspect that it may have been a bad installation of Windows 8.1, as we've seen similarly powered laptops perform better.

While we're currently focusing on the negative aspects of the poor Zoomstorm, we have to include the terrible battery life as well, which only managed to last for a couple of hours before it was fully drained, from 100% as well.

The Zoostorm Notebook 3310-3151 only costs in the region of £235, and you could probably chop another tenner at least off that if you shop around. However, even at this price, we don't think you'll get much use out of it or enjoy it as much as the Acer V3, which is incidentally only a few pounds more.

To conclude, we can't really recommend this Zoostorm example as a good touchscreen laptop.

Lenovo ThinkPad X1 Carbon Touch

DETAILS
- **Price: £1,929.99**
- **Manufacturer: Lenovo**
- **Website: goo.gl/nOKTvn**

You have to hand it to Lenovo, it does produce some pretty impressive hardware these days. Although the majority of it products are squarely aimed at small office or business users, the average consumer can of course get some of that special Lenovo professionalism. Provided they're willing to pay for it, that is.

The Lenovo ThinkPad X1 Carbon Touch is a cutting edge touchscreen laptop. It has a stunning WQHD 2560 x 1440 antiglare, ten-point multi-touch 14" IPS panel, a 2.4GHz Intel Core i7-5500U processor, 8GB PC3-12800L memory, HD5500 GPU and a 256GB PCIe x4Ch SSD on to which you'll find a Pro version of Windows 8.1.

As well as that, you'll also find a 720p HD webcam, fingerprint reader, backlit keyboard, a pair of USB 3.0 ports, HDMI, mini DisplayPort, Ethernet extension connection, Intel 7265 ac/b/g/n wireless and Bluetooth 4.0, and an LTE Sierra EM7345 integrated mobile broadband card. An added bonus also comes in the form of the Dolby Home Theatre speakers and dual noise cancelling microphones, making Skype and other conference calling equally impressive.

The design of the X1 Carbon is superb. The matt-black finish complements the new satellite grade carbon fiber construction, making this not only extremely lightweight, weighing just 1.3kg, but also very durable. In fact, Lenovo has tested the X1 Carbon laptops to military specifications including heat, dust, vibration, water and so on. Believe it or not, it's even been tested against solar radiation and fungus.

In terms of responsiveness, the X1 Carbon is a delight to use. The touchscreen reacts instantly, and the overall performance of the laptop is by far one of the best we've tested so far. It could even give the Asus a run for its money on the gaming front, despite the lack of a more heavyweight GPU.

The display too is far crisper and sharper than the previously reviewed laptops, and stands out from the group as one of the most colourful and brightest screens we've come across on a laptop. That and the fact that 2560 x 1440 is an amazing resolution for a laptop means anything you view on this will look pretty amazing.

It is an exceptional, quiet and blisteringly fast laptop, but we have to point out that something of this quality and calibre doesn't come cheap. In fact, you'll be looking at paying somewhere in the region of £1,929 for the base version of the X1 Carbon Touch with an i7 processor. Once you start to add a bigger SSD, better wi-fi adapter and so on, the costs soon mounts up.

It's certainly a lot of money to consider, much like the Toshiba Kira. The guarantee, though, is that you're buying a high-quality product, one that will last you a long time and keep on performing for a number of years to come.

It's an extreme laptop, but if you want something that's going to last you a while, then the Lenovo ThinkPad X1 Carbon Touch is one you should definitely consider.

Asus N550JK

The Asus N550JK manages to pack in ample performance and some reasonable looks for less than £1,000.

Yes it's heavy, but that's a minor quibble when you consider what you get.

Lenovo ThinkPad X1

Okay, so it costs nearly £2,000, but the Lenovo ThinkPad X1 Carbon Touch is an immensely impressive laptop.

There's not much you won't be able to do with it, and it looks pretty amazing as well.

How We Tested

Each laptop was tested with a selection of built-in Windows 8.1 apps for the touchscreen element, as well as MS Office, Skype, general browsing, HD content movie playback and several games (*Elite: Dangerous*, *Watch Dogs*, and *Borderlands 2*).

	Asus N550JK	Acer Aspire V3-112P	HP Envy 15-k252na	Toshiba Kira 13.3	Zoomstorm Notebook 3310-3151	Lenovo ThinkPad X1 Carbon Touch
Price	£750	£249.99	£899.95	£1,199.95	£235	£1,929.99
CPU	i7-4700HQ 2.5GHz	Celeron N2840 2.16GHz	i7-5500U 2.4GHz	i7-5500U 2.4GHz	Celeron 1037U 1.6GHz	i7-5500U 2.4GHz
Memory	8GB	2GB	12GB	8GB	4GB	8GB
Storage	1TB HDD	500GB HDD	1TB SSHD	256GB SSD	500GB HDD	256GB SSD
Screen	15.6" IPS ten-point touch	11.6" LCD ten-point touch	15.6" Multi-touch WLED	13.3" LED ten-point touch	14" LED Multi-touch	14" IPS ten-point touch
Screen Resolution	1920 x 1080	1366 x 768	1920 x 1080	2560 x 1440	1366 x 768	2560 x 1440
Weight	2.7kg	1.4kg	2.6kg	1.4kg	2.1kg	1.3kg
GPU	Nvidia GeForce GTX850M	Intel HD	Nvidia GeForce GTX850M	HD5500	Intel HD	HD5500
HDMI	Yes	Yes	Yes	Yes	Yes	Yes
No USB 3.0 Ports	3	1	3	1	0	2
No USB 2.0 Ports	0	1	0	2	3	0

Your Letters

Mobile Challenge

I'd like to offer an alternative to the Nexus 4 you chose: the Motorola Razr i.

When it was released, it got rave reviews, and time hasn't really devalued those opinions. It's still a cracking phone today. Excellent build quality, two-day battery life and the just released KitKat update has given it a new lease of life. Better still, I've seen them go for £30 on eBay. There really is nothing to compare, spec-wise, for the price.

You chose the Tab 7.7 largely for the screen. You'd be better off with the original Hudl. Quad-core processor, HDMI out, two-day battery life with normal use, higher resolution screen than the Samsung... As an all rounder, again for the price, it can't be beaten. Just my opinion of course, but you know I'm right :)

Darryl Brown

More Reasons To Love Linux

You published my letter on why I use Linux in issue 1355, and since then I have thought of more reasons to be grateful I run Linux.

My wife does some marking for one of the exam boards, and they no longer support Windows XP (they have never supported Linux, as the marking has to be done in Internet Explorer). Her current PC is a dual-boot with XP and Mint, so as a result of her marking, she now requires a working Windows 7 PC. I have a dual-core base unit with 4GB DDR2 RAM and 160GB HDD, which was more than adequate for the job, so I decided to use this.

My first thought was to run Mint 17.1 with Windows 7 in VirtualBox, but after the installation, the Windows 7 virtual machine was a bit like treacle even when configured for optimum performance regarding the resources, so I went to plan B and a new dual-boot system with Windows 7 and Mint 17.1 installed. As usual, you have to do the Windows installation first, as it will not recognise any other OSs on the disc. I did this and the first round of updates. I was surprised that this being an older PC, all the drivers needed were there out of the box, and thankfully I did not have the usual merry-go-round of hunting for these online. After defragmenting the HDD, I installed the Mint partition and completed the updates for this in just over an hour.

Back to Windows 7, I have spent the best part of 16 hours (and still counting) installing update after update on Windows 7. It's not the large amount of updates needed that I get frustrated with (Linux Mint needs to do this at times as well) but the way the OS needs to constantly restart during the process, making the PC almost useless during this time. Also as a dual-boot system, I could not just leave it, as the default OS is Linux, so I needed to be there to ensure that on restart it is booting to Windows. In Mint I can set updates going and get on with other things and only rarely will I be prompted to reboot if a kernel update needs a restart to implement, but when I do restart the PC, I don't have to wait several hours for the PC to be usable again.

In my opinion, when companies that are based in the cloud start to make their services completely OS independent, then Windows is doomed, and this may not be too far in the future, given the number of cloud-based services now starting to appear that can be used from 'any' browser. If I wanted to, I can even use MS Office services via my Windows Outlook account in Linux and for free, albeit with very basic functionality but perfectly adequate for most home users' needs.

If Microsoft wants to remain a player in the OS and software market in the next few years, then it has to grasp the fact that things have changed and users are no longer welded to their products in the same way they were in the late 1990s and the first decade of the 21st century

Android and Chrome OS are starting to prove this already, and it can only get more competitive as time goes on.

Tony Hughes

Keyboard Frustrations

Keys you'll never use:

Num Lock: on the contrary, very useful if you have to enter accented letters and special characters into a text editor or basic word-processor.

NumLock On, while holding down Alt, type the character number on the keypad (not the main keyboard), release the Alt, et voilà: your accented letter or character. For example, character number 130 gives you e-acute.

Lists of the character numbers are widely available on the web.

Jim Dunnett

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REPLACING THE COOLER ON YOUR GRAPHICS CARD

It's not as difficult as you might think, as James Hunt explains

Although it's common to want a more efficient cooler for your CPU or better extractor fans for your case, most people would never dream of taking their graphics card to bits to improve the cooling. Yet it's entirely possible to do just that.

In a way, it's understandable. Graphics cards are expensive and don't seem to be user-serviceable: unlike processors, the cooling systems come pre-attached. But like CPUs, if you improve the cooling on your graphics card, you might find that you get better performance out of the hardware. Overclocking a GPU is easier than overclocking a CPU, such that you can do it in software, and if anything goes wrong, it's easier to recover from as well. The performance hike you get will also be far more relevant to gaming than an overclocked CPU would be.

That said, replacing GPU fans isn't just about performance. Learning to replace your fan might be the difference between a card you have to junk and a card you can hang on to or resell. It can reduce the amount of noise you get out of your system. It might even allow you to save power. All you have to do is take the plunge and remember that there's no real difference between a GPU and a CPU except the name. If you can change a fan on your main processor, there's no reason you can't do it on your graphics card.

The Tools

In fairness, while the principles of replacing a cooler on your graphics card are the same as replacing one on your CPU, things aren't quite so straightforward. It's not quite as simple as popping out some plastic bolts and pressing down hard. You will need the following:

Your Replacement Cooler

Be it a fan, heatsink or liquid-cooling hybrid, you'll need to start this process by picking a replacement cooler. Prices range from a couple of quid for a replacement fan to well over a hundred for the super-efficient multi-fan. You'll have to check whether they fit your card, but broadly speaking, third-party coolers are built to be compatible with most designs.

A Couple Of Phillips-Head Screwdrivers

You need one for removing the graphics card from its slot and another, much smaller one for removing the existing housing and coolers on your graphics card.

Thermal Paste

This will probably come with the cooler either as a pre-applied square or as a packed-in tube, but if it doesn't you'll need to get some. As with CPUs, thermal paste allows you to connect heatsinks and fans to the GPU in a way that allows heat to be quickly conducted into the cooling elements of the device. Without it you might as well be flapping a newspaper at the processor. If you leave out or misapply the thermal paste, you can expect to burn out your hardware fairly quickly, so make sure this doesn't happen!

A Dry Tissue Or Anti-Static Cloth

As ever, you should also take care not to cause a static shock in any of the components while handling them. This can be avoided fairly easily by touching a radiator to ground yourself beforehand, but it's also worth taking care not to scuff up against carpet or rub balloons on yourself during the process.

If you need to wipe your card or its components (whether to clean dust or remove errant thermal paste),

then you should always use a dry cloth or piece of tissue. Try to dab rather than wipe to avoid spreading the dirt or snagging fragile components. If you use a cloth, make sure it's anti-static so you don't accidentally fry your hardware!

The Process

Before you begin doing anything with the hardware, it's worth running a benchmark on your card. This will give you the base levels of performance and temperature so you can compare the results later. The best way to know you've done something right is that these numbers improve, and the best way to discover you've done something wrong is if they don't. You can use a program such as GPU Shark to get some quick baseline values, and only then should you shut down your PC so you can start the cooler replacement process.

Begin by removing the card from its PCI slot, taking care to disconnect any power cables or extensions that may be present, such as an SLI bridge or LED power cords. Place it on an anti-static surface (i.e. not your carpet).

Use the screwdriver to remove the existing case (if applicable) and cooling unit. You may want to take reference photos so it's easier to reassemble. Picking the right screws to remove at the right time can be difficult, but it makes most sense to start with the ones on the side of the card since they usually hold the cooler on. If those don't look right, look under the fan blades, because screws there are sometimes used to fix the fan housing onto a heatsink.

You may also find an assembly bracket on the bottom of the card, which you'll have to remove before you can remove the fan. Each card is different, so if you want to be certain what you're doing it might be worth looking up your particular model on YouTube to see if there are any instructional videos available.

Once the cooler is loose, find and remove the fan's power cable. This is normally a standard three-pin connector with red, black and yellow wires – only instead of attaching to the motherboard, it's attached to the graphics card. Remember that if the card has multiple fans, you'll probably have multiple fan power sockets.

If the heatsink is separate, it may require a little twist or pull to disconnect it from the GPU itself. Don't force it, though; thermal paste isn't glue, so if the heatsink won't move, it's probably connected to the card in a way you've missed. Once the GPU has been exposed, wipe the paste away with dry tissue or an anti-static cloth. Do not press down too hard or you risk damaging the GPU!

Now, unpack your new cooler and reapply an appropriate amount of fresh thermal paste to the GPU. It doesn't need to be much – only enough to mostly cover the chip once it's pressed flat. Somewhere between a grain of rice and a small pea-sized blob is more than enough. Once that's in place, you can put the new cooler on top and screw it into place starting with two opposite diagonals to keep the pressure even. Again, don't screw too hard otherwise you risk damaging the chip.

Some guides will recommend that you spread the paste over the whole chip first, but we prefer to let the cooler squeeze it into place, which helps avoid air bubbles. Try not to slide the cooler around once it's attached – you want to paste to stay in contact with the CPU and cooler and nothing else, otherwise heat will spread in the wrong direction and into the wrong components. When the cooler has been screwed into place, you can then reconnect the power cable and replace the case.

At this point, it's advisable to test your card, even if everything seems to have gone well. Place it back in your PC and use your GPU monitoring program to test its performance. If you got everything correct, the temperature should be lower than before – or at the very least the same. If the temperature has gone significantly up, you may have used too little thermal paste or otherwise misapplied the cooler, so investigate any errors carefully. The most common problems are that the thermal paste has been applied wrong or the fan's power cable was attached incorrectly and isn't working. Whatever the reason, if your card's temperature shoots up, then shut down immediately and investigate!

If your temperature has gone down, then good news: your card will be less stressed, and you now have some overhead for overclocking, if that was your goal. Either way, be proud that you've successfully replaced your GPU cooler. Wasn't so hard after all, was it? **mm**

The Best Of Mac App Store

Keir Thomas dips into Apple's app store for Macs to uncover some tasty (and free) delectable morsels

As with many things Apple has introduced to much fanfare, it might seem the company invented the app store. The reality is nothing of the kind. Ask any Nokia phone user, for example, who was downloading JAR apps direct to their device back in the last century. However, starting with the iPhone, Apple did what it typically does: it refined the app store concept and showed how it could be useful. When the iPad came along, it too got some app store love and, in a somewhat brave move, in 2010 Apple expanded the concept to the Mac OS X operating system. Then again, Apple had little choice because the CD/DVD-ROM drive was beginning to disappear from Macs, as Jony Ive innovated it out of existence.

While iOS users simply have little choice but to use the app store, Mac users can still download apps manually. That's how Microsoft distributes Office for the Mac should you subscribe to Office 365, for example. Perhaps because of this, and the fact that big names like Adobe have only dipped their toes in the Mac App Store waters, it's hard to claim the Mac App Store has been even a fraction as successful as its siblings. Many Mac users are not even aware it exists, in fact – something Apple has attempted to address in OS X Yosemite by building the system update components into the App Store.

Nonetheless, there's a lot to discover in the Mac App Store, and the advantages of apps installed through it shouldn't be ignored: each app is security vetted by Apple engineers, for example, and they're usually sandboxed so they can't damage the system by accident – or otherwise. Then there's the fact that apps are updated automatically and the fact that annoying trial or demo software is prohibited (although apps are sometimes supported by adverts).

Below we take a look at ten apps that you might just find you can't live without. All are free of charge and can be installed via the App Store by a simple search and a couple of clicks.

FormatMatch

Ever copied and pasted text from a web page, and copied across its ridiculous font and colour choices too? Macs have a built-in shortcut to paste in while stripping away formatting – Shift+Alt+Cmd+V – but you'll need to sew on an extra finger to hit it without inducing pain.

FormatMatch sits in the background as a menu bar icon and does nothing more than automatically strip the formatting out of any text copied to the clipboard. When you then paste, using the usual keyboard shortcut or Edit menu entry, the text is inserted as plain text – and stripped even of bold or italics formatting. For those times when you might actually want to paste in formatted text, you can click the menu bar icon to disable FormatMatch or open its preferences dialogue box to create a keyboard shortcut that will do the same thing.

While FormatMatch is free, I'd pay for a version that stripped out everything but bold and italics. However, as a step in the right direction, FormatMatch is simply invaluable.

Skitch

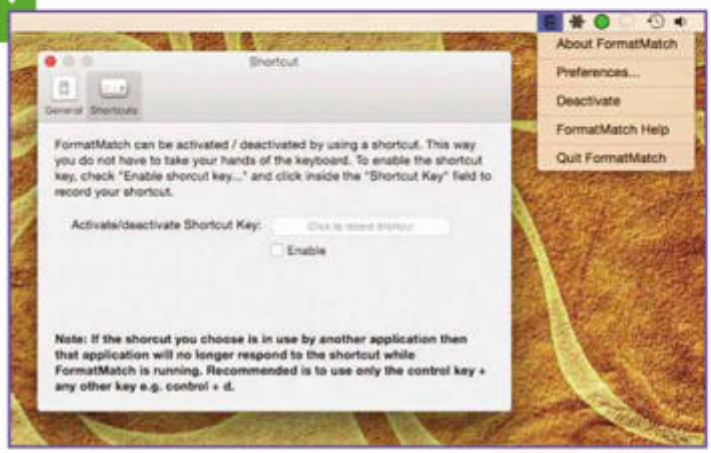
In theory this is an extension of the popular Evernote note-taking service, and again in theory you'll need to be a premium subscriber to get the most from it, but there's no purchase necessary if you simply want to save things to your own hard disk. In fact, the only reminder of the app's Evernote genesis is a small Sign In link at the top left of the program window.

Skitch is a document mark-up tool, a little like the built-in Preview app. However, Skitch's strength is in creating screenshots, and here it's more sophisticated than the built-in OS X tools, because it allows you to drag around the area you want to capture using a crosshair while the non-selected areas are greyed out. There's also timed capture via the crosshair selection tool, a unique feature even OS X's venerable built-in Grab app can't boast.

Once you've grabbed a screenshot, you can mark it up in various ways, such as quickly adding arrows to point to things of interest or adding shapes and text to highlight areas. Other clever tools include an instant pixelate tool, which will apply a blurring mosaic effect to any details you drag it across – ideal if your screenshot includes personal information like an email address that you don't want to share with others.

You can also use Skitch's toolkit to mark up PDFs as well as snapshots taken using the computer's own camera. These can be imported via the menu at the top of the program window.

Saving the file is simply a matter of dragging the icon in the tab beneath each image to a Finder window to copy the file there, and it will be saved in PNG format by default, although the File > Export function on the menu lets you save in just about every popular image format.



Simple apps are sometimes the best, and FormatMatch does little more than strip formatting from pasteboard text

Screen grabbing and annotating are not just easy with Skitch, but become almost fun to do

EasyFind

If this app had an advertising tagline, it might be the following: 'For searching in OS X use Spotlight. For everything else, use EasyFind.'

In other words, and as its name suggests, EasyFind is a search tool – and one of the old-school search tools that doesn't rely on clever indexing of files but uses brute force to search the contents of every one until it finds what you're looking for. It's astonishingly quick, churning through hundreds if not thousands of files every second, and you can select to search through package contents (e.g. apps) as well as invisible files and folders.

Results are shown in the interface and EasyFind ties into the built-in Quick Look tool so you can quickly see if the file is the one you're looking for by a quick click. Another button on the toolbar also lets you reveal the file in Finder, while a Share option again ties into a system component to let you get the files to others.

And that's all there is to say about EasyFind. It's a simple app that's superb at what it does and should be kept on your hard disk for those times that you lose a file and Spotlight shrugs its shoulders.

Who's On My WiFi

With a title that presents no challenges to comprehension, Who's On My WiFi is in fact a general network scanner that shows other machines connected to your Ethernet and/or wireless network (in other words, that are on the same subnet as you). You're told the machine's IP address, along with its MAC address (that is, the physical address hardwired into it), and at the right-hand side of the results table is a heading that lets you mark whether the device is known or unknown. The idea is that you can leave the app running in the background, where it will scan periodically. Via a numbered badge icon on the app's dock icon, and notification updates, you can instantly see when new computers join the network.

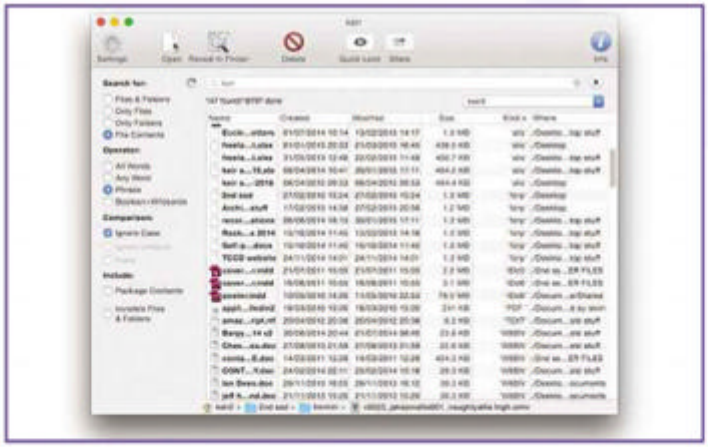
Each item in the list can be renamed to make things easy to read, and the app will also probe the manufacturer of each device across the network, so something like Apple, Inc. will almost certainly be an iPhone or iPad, for example. Because of this, the app involves a little setup work as you match MAC addresses to devices and create names for them, but once this is done it works perfectly.

Who's On My WiFi is really a demo for a $9.95 monthly subscription service that adds remote monitoring and online reports, but most of us can manage without these, and the app is in no other way crippled.

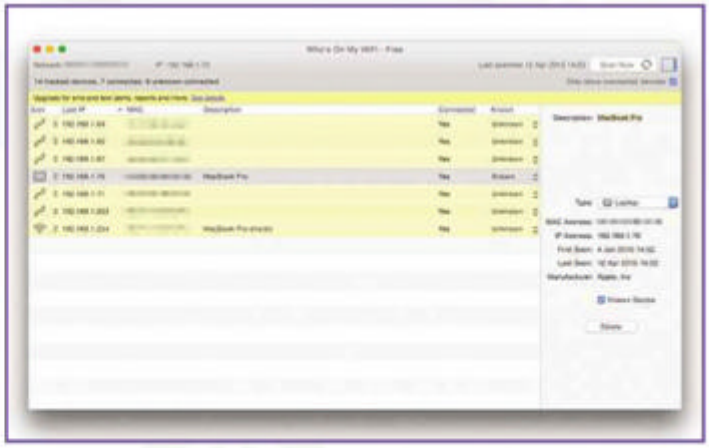
Cobook

This app's name might imply cookery but in fact it's much better than that: it transfers the complete functionality of the built-in Contacts app to a well-designed and user-friendly app that lives in the menu bar at the top right of the screen. Simply click it to see an alphabetical list of your contacts, or start typing to look up an individual. Once you do, you can click on their entry to see a pop-out box akin to Quick Look, showing all their details. Double-clicking any detail will

An old-fashioned file (and contents) finding tool, EasyFind is worth keeping on your hard disk for emergencies



Keeping a permanent eye on what devices are accessing your network is easy with Who's On My WiFi



open the associated app. Double-clicking an email address will start a new email, for example, while double-clicking a Facebook entry (if the entry has one) will open the individual's wall in your browser. You can also click buttons along the bottom of the main Cobook pop-out menu to do the same things, including messaging people.

Cobook doesn't add a single thing to the built-in OS X contacts system. It simply provides access to it, although it does rename a few actions you might ordinarily carry out; it swaps the term Tags for the traditional Groups feature, for example.

Other functions you might expect to find in the main Contacts app are here too. You can create, edit or merge contact cards, for example, and everything is automatically synced to iCloud as you might expect.

In reality, Cobook shows how Apple should be doing things. That the Contacts app is not more easily accessible is something of a blunder.

The Unarchiver

Not all apps live out in the open, and The Unarchiver is an example of an app that you'll rarely if ever start by clicking its icon. Instead, The Unarchiver comes to life whenever you double-click a non-zip archive file, such as .rar, the older Stuffit file types or even Unix stalwarts such as .tar or .gzip. As with the built-in OS X unzipping app, all you'll see is a brief progress bar (and on newer, more powerful Macs, it'll be very brief indeed) before the app quits. The app does add an entry to the Applications list, but it's only a control panel, in which you can set which file types the app should open.

This is an essential app for any OS X system. True, it can only bulk decompress the entire file, and you'll have to pay for an upgrade to be able to look inside archives (The Archive Browser costs £2.99) but, as with many things that Apple deigns not to include in OS X, we have to wonder why better file archive support isn't a standard feature. Until Apple changes its mind, The Unarchiver should be a considered the first thing you grab after unboxing a new Mac.

“There's a lot to discover in the Mac App Store, and the advantages of apps installed through it shouldn't be ignored”

MPlayerX

Because of licensing issues, Apple's app store concept isn't entirely friendly towards open-source software. The fact it also costs money just to list an app perhaps doesn't help (hey, this *is* Apple we're talking about), but there's nothing to stop a developer taking open-source technology and packaging it for Mac App Store consumption. That's what's happened with the superb MPlayerX project. The X stands for XWindow, of course, but that's anachronistic nowadays, and the Mac version of the app runs natively like any other app.

If you've used MPlayer for Linux or Windows, then you're not in for any surprises, and what you get is a very capable media player capable of understanding just about every audio and video format out there, such as Windows Media or the MKV format used as a container when DVD/Blu-ray movies are distributed outside of official channels (ahem).

Most of the app's useful features are found on the menu, and these include invaluable video and audio tuner tools that let you correct for badly encoded files, while on the AVS menu you'll find tools to control playback speed and repair sync errors.

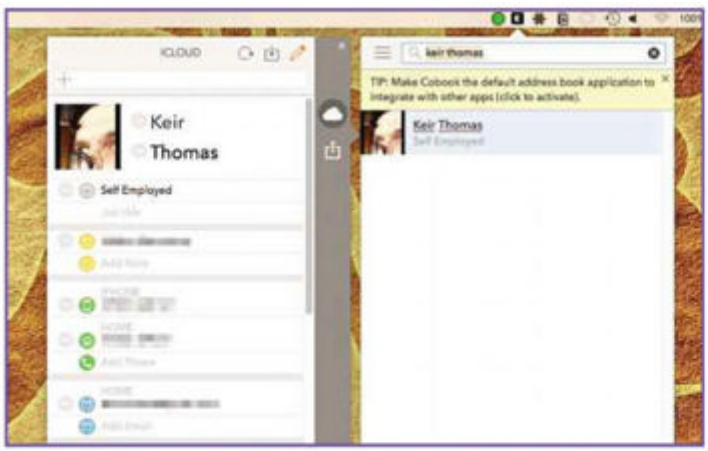
All in all, MPlayerX is pretty much everything you could want from a media player, and it keeps things simple to boot.

Memory Monitor

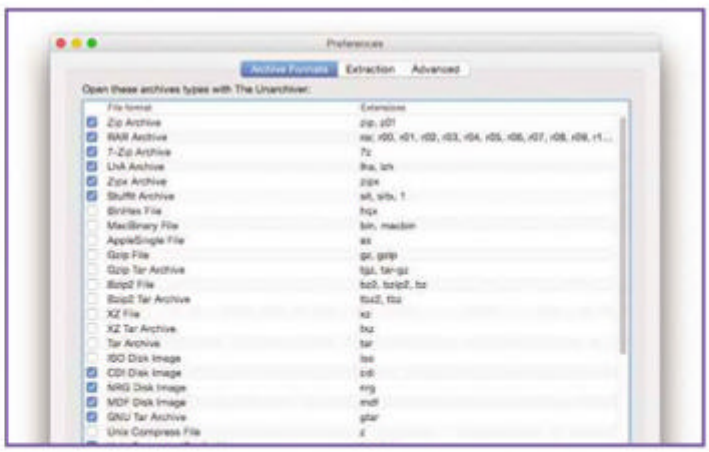
Is it worthwhile manually clearing out your computer's RAM? That's a debate that's been going on since the IBM PC first hit the shelves, and perhaps the 21st century answer is that modern operating systems are extremely sophisticated. They simply don't need manual intervention – or at least not most of the time. The exception might occur before launching a memory-churning app such as a video or photo editor, when every megabyte of free physical RAM is vital.

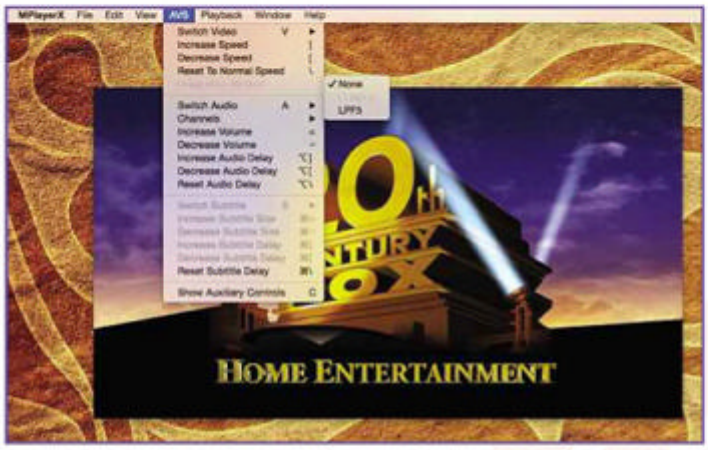
Memory Monitor is the answer, although it isn't just about optimisation, which can be done by clicking the menu icon. Memory Monitor also shows a graph of current RAM usage, including a 'pressure' figure that shows the demand apps are placing on physical RAM (which is presumably measured by monitoring swap file usage). The menu also offers an option to auto-optimise the RAM, although it's not explained what this means. We'd guess that optimisation will subsequently take place when physical RAM amounts drop below a set number, although there's no option to set what this is.

Cobook transfers all the functionality of the built-in Contacts app to a very well-designed and useful menu bar app

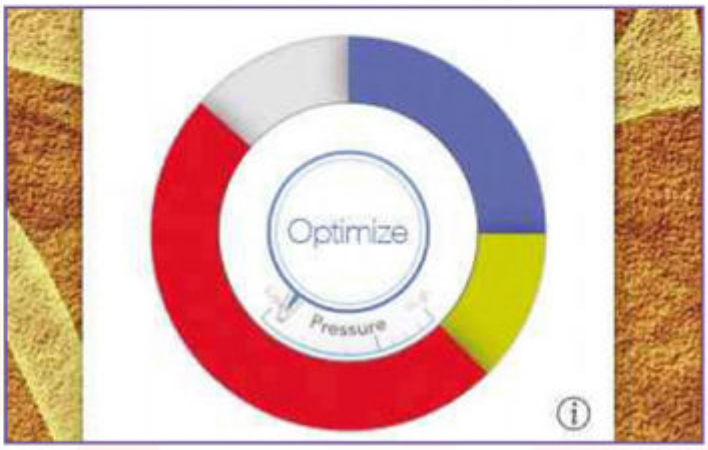


The Unarchiver extends Mac OS X's knowledge of compression archive formats so that just about every file type is covered





MPlayerX is an OS X port of the familiar Linux/Windows open-source project and offers just about every feature you'll need



Memory Monitor lets you not only monitor what your RAM is up to but also optimise physical RAM allocation

The app works as a menu bar icon and sits in the background most of the time. You can change the app icon to that of a reading of the physical RAM available, allowing you to keep an eye on things at all times.

NovaBench

And talking of optimisations, what better way of testing your Mac's performance than to run a handful of benchmarks? That's what NovaBench is all about, and it focuses on six areas: floating point, integer arithmetic, MD5 hashing speeds, 3D graphics, RAM read/write and disk read/write. You can upload your results to the NovaBench.com website too in order to compare alongside others.

The app keeps things pretty simple, with only three toolbar buttons: Start Tests, Open Results, and Results Database, that takes you to the aforementioned website. Obviously, before running tests you should quit all the apps you can and run a memory optimisation using an app like Memory Monitor. Most of the benchmarks run silently and the only indication of progress is a bar display, with the exception of the 3D test that out of necessity involves drawing animations on the screen.

NovaBench is quick and dirty, and took less than a minute to complete on our test system. In other words, don't expect the thoroughness of 3DMark or the like. However, for a quick comparison of before/after tweaks, or even hardware upgrades, it ticks all the right boxes.

RC Mini Racers

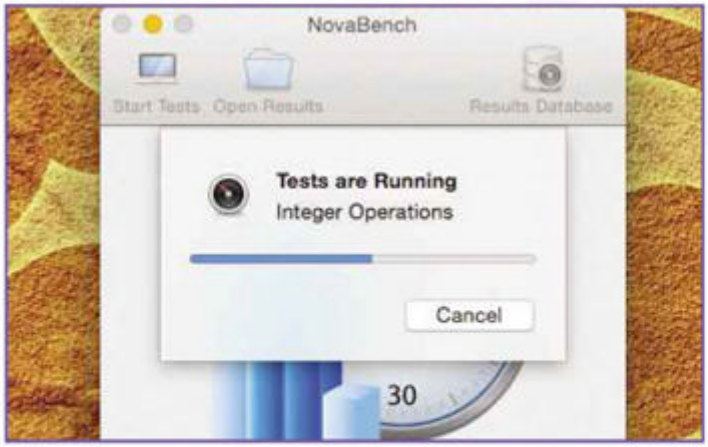
The Mac isn't for gamers? Why, sir, I take issue with that, and *RC Mini Racers* is a fine example of the fun games that can be found in the Mac App Store. Okay, so it has the look and feel of an original PlayStation game from 2002, but that doesn't mean it isn't fun.

The aim of the game is to race your radio-controlled car around a circuit comprising an average suburban neighbourhood in the US. Because your car is tiny, everything you drive around is very large. Thus, you can take a shortcut by driving under actual cars, for example. Rather than winning points, you earn virtual dollars that can be used to buy mods for your car before you race (and unsurprisingly these virtual dollars are also available as in-app purchases). Several different models of cars are available too.

One of the best features of the game is that your car really does act like it's made out of plastic and is lightweight, so you can tumble around everywhere without sustaining damage – including using other cars as ramps. And while it's been a while since we played with a real-life remote control car, the responsiveness and acceleration seemed very authentic as far as we could tell.

RC Mini Racers isn't intended to be an all consuming affair of a game, but for spending a few minutes doing something other than work, it comes highly recommended. **mm**

NovaBench provides quick and dirty benchmarks to show the speed of your Mac against others in an online database



The Mac App Store also contains games, an example of which is the fun RC Mini Racers, which puts you in control of a remote-controlled car

How Scared Should We Be Of SECURITY BREACHES?

We're all pretty up to speed on the risks of using unsecured networks or taking our work home with us, right? Well, maybe we're getting complacent...

How often do you think about your computer's security? The answer probably varies depending on what you're doing and where you are. If you're at home, doing something fairly non-sensitive like just browsing the web, you're gonna be pretty comfortable that your network and your security software are keeping you safe enough. If you're away from home, though, you might wonder whether it's safe to access your online banking over an unknown wi-fi network. At work? Unless you work in the IT department, you're probably not overly concerned. Everything's probably okay, right?

Well, maybe not. Every year, the Department for Business, Innovation and Skills (BIS) runs a massive cyber security survey for UK businesses, and every year, the results are a bit troubling. Plus over the last year or so we've seen some pretty massive bugs affecting sites and services we'd previously thought were pretty secure.

Are we all getting a bit complacent about data security? Looking into the number of security breaches that happen every year, both because of cyber-attacks and innocent mistakes, it's starting to seem like individuals and businesses alike need to take more care over their data...

Cold Hard Facts

Although significant cyber-attacks might make headlines, it's easy to assume that most people and businesses are safe enough most of the time. The BIS surveys explode that idea. According to the stats, in 2014 some 81% of large organisations had a malicious security breach; the year before, 88% had, so it's not a one-off. Smaller organisations weren't safe either either 60% reporting they'd had a breach. And worryingly, more than half of the respondents said they expected there would be more security incidents in the following year.

The type of breach they're talking about is worth noting here: among large organisations, 73% of the breaches involved infection by viruses or other malicious software; 44% involved theft or fraud; and 55% involved hacking attempts, while 58% were other issues caused by staff.

How Businesses Can Stay Secure

As well as keeping us updated on how terrifying the internet can be, our own government has published guidance on how businesses should protect themselves in cyberspace. You can read the whole thing here: **bit.ly/1xnnpd0,** but the gist is....

↔ Create An Information Risk Management Regime
Basically, take information security seriously, and make sure your employees and partners know what they should be doing to keep sensitive information safe.

↔ Configure Your Systems Securely
That means introducing and documenting policies regarding exactly how your IT system should be run, and also making sure ICT systems are set up securely and kept patched.

↔ Protect Your Networks
All network traffic will need to be filtered and monitored – both incoming and outgoing traffic should be checked for anything suspicious or malicious and dealt with accordingly.

↔ Manage User Privileges
Not everyone needs access to everything, and the more people who can access information, the less secure it is. So make sure employees have what they need to do their job, but no more.

↔ Educate Your Users
Make sure you've got security policies in place to let users know what they should be doing (and what they shouldn't). Make sure employees also get regular training on the potential risks they'll face in their roles.

The Biggest Breaches... Of Last Year

Some of the biggest cyber security breaches ever happened recently. As recently as last year, in fact. Want to give yourself nightmares? Here are three of the worst:

↔ eBay

At some point between February and March 2014, hackers got hold of an internal eBay corporate account and used it to gather usernames, email addresses, physical addresses, phone numbers and dates of birth for any number of the site's 145 million users. On the bright side, users' passwords are encrypted, so it's likely they weren't compromised, but eBay urged all users to change their passwords anyway.

↔ JP Morgan Chase

A neglected server let hackers access records belonging to some 83 million accounts held by US bank JP Morgan Chase. At first it was thought the hackers had managed to alter or delete some accounts, though later it turned out they had mostly accessed personal information like names, addresses, phone numbers and email addresses – login information wasn't compromised. Still, customers were warned to be on the lookout for phishing scams.

↔ Home Depot

Another Stateside company hit by hackers last year was Home Depot. Its payment systems were infected with malware that let cybercriminals steal, over the course of around five moments, credit card details of more than 56 million customers. The company installed new encryption software that meant nothing like it could happen again, but considering the scale of the fraud, it felt a little late.

The results of this year's survey won't be out for a few months, so let's cross our fingers that improvements have been made. However, considering some of the biggest companies in the world got hacked and suffered some pretty serious consequences to both their finances and their reputation over the last 12 months, it's hard to be confident about that.

What's The Damage?

There's another thing worth paying attention to in the BIS report: although the number of cyber security breaches had decreased, slightly, between 2013 and 2014, the cost of those breaches had increased. Actually, it had almost doubled. Small organisations saw breaches cost an average of £115,000, while larger ones could face costs of £1.15 million. Gulp.

Let's hear some more horror stories. Last year, eBay was the victim of a group of hackers, and a huge number of user records were accessed (see the boxout); while having to admit to your users that you've failed to protect their information is bad enough, but the embarrassment was followed by legal proceedings. Collin Green, an eBay user from Louisiana, started a class action lawsuit against the auction site, with claims totalling more than $5 million.

It's not just businesses either – the Information Commissioner's Office (ICO) handed the Ministry of Justice a whopping £180,000 fine last August for several data protection failings within the prison system. Yup, even prisons can't keep their data locked down. One example of a data protection breach involved HMP Erlestoke prison, where a member of staff lost a hard drive containing sensitive information relating to nearly 3,000 prisoners – and the drive turned out to be unencrypted. The take-away from that is, nothing is as safe as you think it is, and even if someone's not actively trying to steal your data, security breaches can have serious consequences.

Individual employees can be held responsible – and punished – for data breaches as well as businesses, which should also make you more aware of your actions at work. The ICO has the power to hand out fines of up to £500,000, which is enough to make anyone think twice about emailing themselves unencrypted data at home.

Are You Scared Yet?

You don't need to yank out your modem and smash up your smartphone just yet, but it's starting to look like we could all stand to be just a bit more careful. When it comes to work, it's easy to feel like security might be someone else's problem, but while many security breaches happen because of insufficient defences against malware, there are others that happen because employees didn't pick strong passwords, or didn't encrypt their work laptops before leaving them in the boots of their cars. As long as there are computers, there's going to be cybercrime, with criminals becoming ever more devious in their attacks. Be careful out there, guys. **mm**

↔ Incident Response Procedures

What do you do if there is a security breach? Make sure to plan ahead and have processes in place for what will happen when things go wrong – and train staff to follow them.

↔ Protect Yourself Against Malware

Again, policies should be set up to cover how various devices should be used and protected against malware – and then all company-owned computers, phones and other devices should be regularly scanned and virus-checked.

↔ Monitor Your Systems And Learn From Past Attacks

Pretty self-explanatory, this, but the best way to avoid disaster is to be constantly vigilant and watch for unusual activity that might indicate an attack.

↔ Watch Out For Removable Media

USB sticks and DVDs should be scanned for malware before data is copied onto business computers – and there should be policies about how and what kind of media is used.

↔ Be Careful Of Mobile Working

Remote working is great and all, but again users need to be taught what the rules are regarding use of portable devices on business networks and, perhaps more pertinently, away from them – depending on the business in question, someone losing an unencrypted laptop could be disastrous in terms of data security, so work out the risks and put measures in place to limit them before something goes wrong. This is, of course, something our authorities have learned a lot about over the years.

HAPPY BIRTHDAY ZZAP! 64

David Hayward pays homage to one of the greatest computer magazines of all time

Thirty years ago the UK enjoyed a golden age of computer magazines. *Sinclair User*, *Your Sinclair*, *Personal Computer Games*, *What Micro*, *C&VG (Computer & Videogames)* and (of course) *Crash* were the highlight of the month for many teenager who visited the newspaper shops.

These magazines were more than just words on paper, they were a part of our lives and we absorbed every page as if it were a religious text in front of us. If then these publications were our religion, the high temple was that of Newsfield Ltd, located in sunny Ludlow. With its ever-impressive *Crash* selling in excess of 100,000 copies a month to eager Spectrum users – informing us, keeping us up to date and helping us get the best from our tiny rubber keyboard machines – it was inevitable that the Newsfield editorial team of Roger Kean, Oliver Frey and Franco Frey would turn their sights to the other great 8-bit machine of that time, the Commodore 64.

Mid-1984

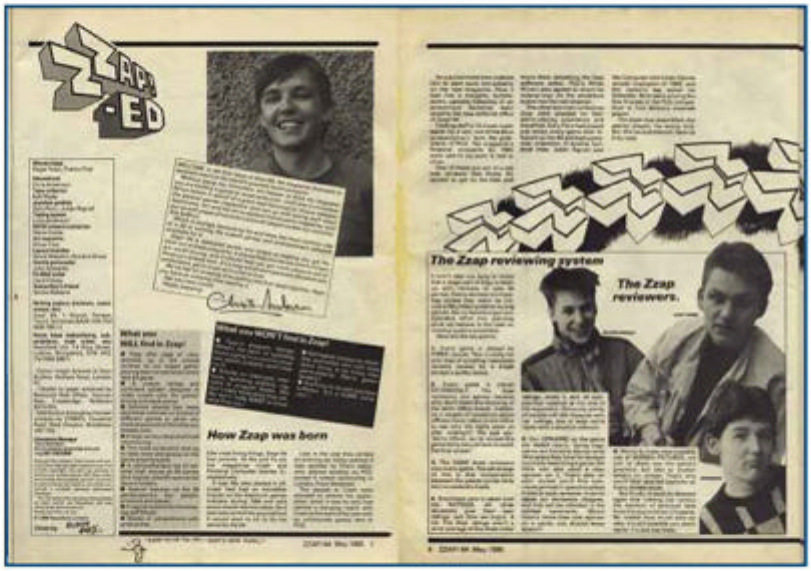
Within just six issues of *Crash* it was evident that the readers wanted more of that Newsfield magic, but for those who owned a C64. The end result was of course *Zzap!64*, with the first copy hitting the shelves on April 11th 1985.

"When Oliver and Franco Frey discussed possibilities with me, the first thing that became clear was that we'd need an editor, since I still had my hands fully occupied with *Crash*." Said Roger Kean, who we spoke to about the history of *Zzap!64*.

The lack of modern day printing, word processing, emailing, and instant imaging meant long days and nights slaving over what would constitute the content of *Crash* for those involved – to make sure that the same attention to detail was inherited by *Zzap!64*, there was a lot of work ahead and many creases to be ironed out. However, as Roger goes on to say, "The decision to go ahead and prepare a C64 magazine leaked to *Computer Trade Weekly* and a week after a small news item I was astonished to take a phone call from Chris Anderson, then editor of the multi-format *Personal Computer Games* magazine." Chris Anderson, as it turns out, was interested in heading up a single format magazine, and as Roger mentions, he "professed an admiration for *Crash*, and wanted to do something similar for C64 users."

With Chris expressing his interest, a meeting was soon scheduled and over a bottle of wine, Roger, Oliver and Chris (who apparently favoured soft drinks), began to hash out what would ultimately become the first issue of *Zzap!64*. There were some differences in ideas that needed to be addressed first, though.

As Roger goes on to explain. "It became clear too that his idea of translating *Crash* into *Zzap* meant



▲ *To the C64 gamer Zzap!64 was pure magic, and the team legendary gamers*

Behind The Scenes

Obviously, we need to thank Roger Kean and Oliver Frey for supplying us with a detailed background to how *Zzap!64* was born but, as Roger mentions below, there were others who worked behind the scenes to bring us such an iconic masterpiece.

"The 'longest-lived' Newsfield employees who worked on *Zzap!64* were in the production department: Matthew Uffindell (1983–1999), Ian and Paul Chubb (1985–1999), the unsung heroes of putting magazines together. One other, a voice on the telephone for readers ringing to ask about matters like mail order and subscriptions: Carol Parkinson née Kinsey (1984–1999)."

Our beloved copy of Zzap!64, a little worn these days but still very readable

Sadly, the last ever Zzap!64, issue 90

completely rewriting the rulebook. Out went the 'set solid' typesetting in 8pt Helvetica; teenage boys can't read such small print with no space between the lines... and out went what we felt had made *Crash* unique – using local schoolboys to review the games. Chris wanted a dedicated, fully employed team of reviewer-writers. Young, but older than school kids. And they'd be based where he lived at Yeovil."

Thankfully, Chris liked the title of the proposed magazine, *Zzap!*, since it followed on nicely from *Crash*. interestingly, 'Bang' and 'Wallop' were also possible titles (and were, at one time, also considered for an Amstrad magazine), and the *64* part was later added to confirm that this was in actual fact a magazine for C64 users.

Also, as Roger tells us, where *Crash* had been a nightmare to get off the ground in terms of cashflow, with it being the first magazine in this style and the fact that the printers wanted to be payed nearly two months before the money from the sale of the magazine started to come in, *Zzap!64* began from a much better position. What's more, since Crash was already established and the audience was chomping at the bit for a C64 magazine that followed in much the same style as that much-beloved title, the advertising space was sold well before the first issue was due to hit the printing presses.

Issue 1: April 11th, 1985

When *Zzap!64* was finally unleashed on the public, it was met with the same kind of reverence that *Crash* had enjoyed over the last year. Finally, there was a C64 magazine that didn't just look amazing, but also one that featured honest reviews, from people who were more or less the same age as the readers; but more importantly, from proper gamers.

Julian Rignall and Gary Penn soon became big names within the Commodore scene; their opinions mattered and their sense of humour was wicked. This formed the basis of what the magazine meant for its readers, and was conveyed in such a fashion that you swore blind you knew these two as well any close personal friend.

Rivalry between the magazines was good too, as Roger explains. "I thought staff relations between the two magazines might be sticky, but at the launch party held at the Penny-Anthony restaurant in Ludlow the day the first copies of issue one were delivered, the rivalry was friendly. That was just as well because on that night no one knew that within three months the *Zzap!64* crew would be moving into the King Street premises alongside the Crash team."

Later, as Roger mentioned, to cut costs and streamline the publishing of *Zzap!64*, it was relocated to Ludlow, with Chris Anderson leaving the helm after declining to move with the magazine.

This though didn't stop *Zzap!64* in its tracks, in fact it became more solid – and, if possible, even more focused on delivering what the readers wanted. After Chris, Roger edited the magazine for a time, but was then followed by Gary Penn, Ciaran Brennan, Julian Rignall, Gordon Houghton, Stuart Wynne and Phil King. As Roger fondly recalls, "their dedication made the magazine what it was."

Issue 90, November 1992

Unfortunately all good things inevitably come to an end, and issue 90 was *Zzap!64*'s final bow. With the fall of Newsfield in 1991 – Roger describes the day he called the staff together to announce their redundancies as the "most awful of my life" – *Zzap!64* continued with the newly formed (with Roger, Oliver and many other previous Newsfield staff) Europress-Impact Ltd. An eventual re-launch with Europress changed *Zzap!64* into *Commodore Force*, but the final nail in the coffin was the collapse of Europress in 1994 with just 16 issues of *Commodore Force* to its name.

The Zzap!64 Legacy

So thirty years later here we are, in this modern age of the internet, next generation consoles and PCs so powerful that they were purely science fiction back in the *Zzap!64* days. It brings a smile to our faces though to see that there's still a following of *Zzap!64* readers. With plenty of sites dedicated to bringing a digital version of the magazine, along with countless other fond recollection sites and a popular Facebook page, we can still enjoy reading and reminiscing over the imagery, reviews, and shenanigans of Jaz Rignall and Gary Penn. *Zzap!64* held a special place in the hearts of those who read it, and the new generation who are now interested in retro gaming. Let's hope this continues for the next thirty years. **mm**

Remembering...
Windows NT 4.0

One of David Hayward's Microsoft operating systems gets a look in this week

Mention Windows Me, Vista, Windows 8 or whatever to most users of technology, and you'll probably get one of 'those looks', a kind of cross between don't remind me of that and utter disgust.

Granted, Microsoft has come up with a few duff operating systems in its time; although it's fair to say that once you've mastered Vista and 8.1, there's a good operating system hidden in there. Windows ME, on the other hand, well, we won't even go down that road.

Despite the occasional slip-up, though, Microsoft has offered users a range of excellent workstation and business-based systems. Windows NT 3.1, for example, with its rewritten core, support for loads of memory, network specific security and a host of other specialised services, was an operating system that a company could successfully install on its workstations and be confident that the entire software layer was stable and secure.

The same can be said for the follow-up NT OS from Microsoft, Windows NT 3.51. This time we also got a server-based version, licensing agent and other additional networking tools. The new protected mode 32-bit workstation version was remarkably stable, and introducing User Manager for Domains unleashed a new generation of networked computers.

However, I never really used 3.1 and 3.51 when I started working with computers. For me, it was Windows NT 4.0 that ruled the roost.

Its History

Released on 31st July 1996, Windows NT 4.0 stood out from previous workstation- and business-orientated systems from Microsoft, mainly due to MS adopting the GUI style and functionality of Windows 95.

There were many improvements too, with better security, encryption and support for remote access. Improvements in the TCP/IP stack meant that this was a truly connected business operating system and, of course, the local and domain administration tools were enhanced and somewhat easier to implement and maintain.

The Windows Task Manager was first used in Windows NT 4.0, offering the user and administrator a far more convenient method of viewing the programs and services that were using up the system resources. On the side of the workstation, this meant being able to identify those rogue programs that usually interfered with the daily running of the company's software. And on the server side, the domain admins could free up some of the server's memory when a user's job that was running overnight decided to keep on consuming memory. It just worked, and it was remarkably stable too.

But as Microsoft moved ever onward, Windows NT 4.0 was eventually shelved in favour of the newer Windows 2000, with the last Service Pack, SP6a, being released in 1999.

The Good

Windows NT 4.0 was incredibly stable and could be left running for months without anyone interfering with it.

It was fairly quick too, once it got going, and it came with an early version of DirectX as standard, so you could play a few games with it.

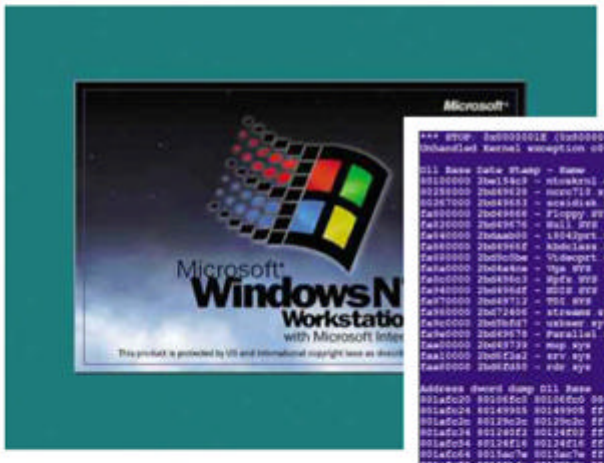
The Bad

Those times when NT 4.0 did decide to fail and never boot again, it had the annoying habit of being nigh on impossible to fix. And if that happened to be the server, there was that bowel-loosening moment where you quickly checked the last backup was good.

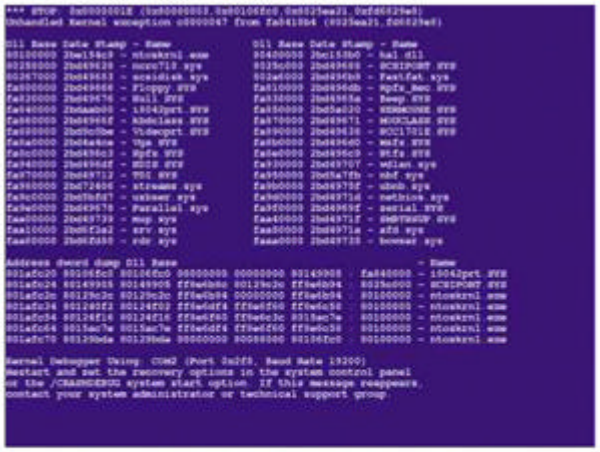
Conclusion

Windows NT 4.0 was a great operating system, either on its own or as a part of a domain. It was easy to use, easy to get up and running and a devil to fix when it did break.

Well done Microsoft, well done, indeed. **mm**



Windows NT 4.0 Workstation, magnificent operating system



This isn't something you want to see on the server monitor first thing on a Monday

Did You Know...

- NT 4.0 introduced system and domain wide policies.
- OpenGL Hardware Acceleration in NT 4.0 was fully supported, so *Quake* could be run on a massively powerful server.
- The maximum amount of physical RAM Windows NT 4.0 supported was 4GB, which was a lot back then.
- It was the last true NT-only operating system before NT and consumer system merged with Windows 2000.

The Things That Frustrate Us About... Self-Checkouts

Intended to make shopping easier, are these inescapable machines actually making things worse?

Remember when self-checkouts were new and shiny and seemed like a good way of using technology to make shopping more convenient? Probably not, because that day might not have actually existed, but they did seem kind of cool at one point. After all, when you're only buying a couple of last-minute things from Tesco it's infuriating to get stuck behind three families with overflowing trollies, and self-checkouts promised a way of quickly paying for yourself without the stress.

Turns out, though, that the technology isn't quite up to scratch. It's been improved over the last few years, and it does seem to be better than it was, but sometimes it turns out humans beat machines at simple tasks. Here are the most annoying things about self-checkouts:

Argh! Wonky Barcodes

We've just passed the worst time of year for this, because it is impossible to scan the barcode on a Cadbury Crème Egg. Impossible. There are lots of other products sold in supermarkets that are difficult or impossible to scan, though; shampoo in a clear bottle is another bizarre one that the system just can't handle.

What's more, if you're buying produce, there might not be a barcode to scan at all, which means you'll have to find your way through the machine's labyrinthine interface just so you can ring up your 35p worth of bananas. It's deeply frustrating that a system made for the average person to use is so unfriendly.

If you can't figure out how to get the checkout to understand what you're buying, you're going to have to call someone over to help. That's annoying because they've often got ten other people vying for their attention too. If only there were some way of deciding who should be served by a member of supermarket staff first – like a queue, maybe?

Fix it: Other than being absurdly careful about what you buy when you're intending to use the self-checkout, you're just going to have to accept the annoyance of calling for a member of staff.

Ughh! "Unexpected Item..."

No there isn't. The only item in the 'bagging area' is what you just scanned. It's a totally *expected* item in the bagging area, it just happens to be heavier than the system expects, and now have to have to wait for a member of staff before you can finish checking out.

Fix it: Call a member of staff. Sigh. Here's a tip, though: while the big blinking red light is going off to attract their attention, you can sometimes save yourself a tiny bit of annoyance by muting the aggravating announcements. Yes, there's a volume button at the bottom of the screen on some, but not all, self-checkouts. So at least there's that.

Doh. Age Restricted Products

Trying to buy alcohol? Knives? Painkillers? Yeah, you're going to need a member of staff to check your ID and okay the sale for you, we're afraid.

Fix it: Just go to a normal checkout. **mm**

David Hayward has been using Linux since Red Hat 2.0 in schools, businesses and at home, which either makes him very knowledgeable or a glutton for extreme punishment

Introducing Lakka

Retro gaming has never looked so good

It's no secret that we here at *Micro Mart* are somewhat partial to a spot of retro gaming. Whether it's on the Spectrum, C64, Sega Mega Drive, Arcades, Game Boy or whatever, you can bet we'll be seen hiding in the corner getting a sneaky game off while the editor's back is turned – usually it's turned because he's playing on something too. So while we were hunting down some quality distros for the best retro experience, we came across Lakka.

A lightweight distro, built on top of RetroArch and featuring a PS3 style interface that's compatible with many types of games controller, it's also specially designed to run on a Raspberry Pi, PC, CuBox-I, HummingBoard, Banana Pi, Cubieboard 2 and Cubietruck. What's more, we're informed that development work for the Raspberry Pi 2 Odroid-C1, is ongoing.

The setup is simple enough, all you need do is browse on over to the Lakka site, found at **www.lakka.tv**, and click on the 'Get Lakka' button. The site will then take you through a six-step process based on the system you currently have and the system you intend to install Lakka on to.

After a short while you'll be able to download the tiny image, just 300MB in the case of the PC version, and transfer it to a handy USB stick.

With the stick in the machine booting from it, you have the choice to either run a Live version or go through the installer. Whichever way you opt for, you'll soon end up with a wonderfully laid out – as we said, PS3-style – Dash style interface, where you can browse through a huge number of pre-installed emulators. The instructions go into detail regarding an available Lakka Box, which will come supplied with many ROMs to get you up and running. However, we have a few available (legal, of course) and instead transferred them to our Lakka install.

The end result was pretty impressive, to say the least. The laptop we were testing it on wasn't the latest and greatest (not by a long shot, in fact) but it managed to perform magnificently. Naturally, these are old games from the Mega Drive and the like, so it should – but running all that through an emulator with the impressive looking graphical layer on top can take its toll.

Next, The Pi Version

Needless to say, our next step will be to get Lakka installed on a Raspberry Pi, so that we could see how everything looks when hooked up to a big screen via it's HDMI connection.

All being well, we should have more to report on that in the coming weeks. That is unless we've been spending far too much time playing instead of writing; something that I assure you doesn't happen often. Mostly.

Get Lakka

We like what we've seen of Lakka so far. It's a stable, well organised and well presented distro. It's easy to use, and it runs really well on older hardware. If you're into some retro gaming, and you haven't got access to the original hardware, then Lakka and an old PC are well worth looking into. Until next time happy retro gaming folks.

Lakka, a retro emulation distro that looks great and works well

A British Celebration

Sven Harvey discovers the British event planned to celebrate the 30th Anniversary of the Amiga unveiling.

On the 23rd of July 1985 Commodore officially unveiled the Commodore Amiga to the public at the Lincoln Centre in New York. The machine unveiled, now known as the Amiga 1000, kicked off the Commodore Amiga as a platform and established a particularly big chunk of the UK home computer and, especially, computer and video game markets – particularly between the launch of the A500 *Batman* Pack in 1989 and Commodore's demise in early 1994.

As mentioned previously, events are being organised to celebrate the 30th anniversary of the unveiling – and, just in time for this issue, I became aware of the first British event (which in turn made me realise that Amiga Mart has now been running in *Micro Mart* for more than half the time the Amiga has been around)!

Taking place at the Marriott Hotel in Peterborough on Sunday 2nd August, the event is tentatively down to run from approximately 1pm until 8:30pm, and is in aid of the BBC's Children In Need charity.

The organising committee is headed by Steve Crietzman, and also includes Darren Glenn (**IntutionBase.com** and previously having run Amiga events), a multimedia specialist in Paul Kitching and dealing with the technical side of things, David Pleasance. Yes... that David Pleasance, from Commodore UK.

The event is expected to take the form of talks, panels and displays in the afternoon (the afternoon programme is in a fluid state as further guests and attendees are cemented), with the main event being a dinner in the evening with a keynote speaker in the form of R.J. Mical, who created Intuition, the AmigaOS user interface system (the underpinnings of Workbench) and worked on several other fields at the original Amiga company and then as part of Commodore-Amiga, Inc.

Tickets are on sale now, with a discount ending on the day of publication of this issue of Micro Mart, so get yourself to www.amiga30.co.uk or to the Facebook event page at **goo.gl/ZIxCNN** for more information, pronto!

Guests So Far!

↔ **R J Mical**
One of the original Amiga Lorraine team who went to work for Commodore, and went on to work on the development of the Atari Lynx, 3DO, PlayStation 3 and PlayStation Vita.

↔ **Commodore UK**
It seems a few team members are yet to be revealed as guests, but already locked down are David Pleasance (he who created the *Batman* Pack and headed the attempted buyout of Commodore International by CBM UK, with Colin Proudfoot), Kieron Sumner (the name behind the the semi-controversial A1500, and who has a rather interesting other buy-out story to tell) and Kelly Sumner (who was with Commodore UK until 1993, and then headed up Take 2 Interactive – owners of 2K, Rockstar, and Red Octane, the makes of *Guitar Hero*).

↔ **Jon Hare**
A Sensible choice as the leader of a certain software team that brought us the likes of *Mega-lo-mania*, *Cannon Fodder* and, well, *Sensible Soccer*!

↔ **Martyn Brown**
This is the man responsible for starting off 17-bit Software, which then developed into a little company known as Team 17 – who you may have heard of... it created *Project X*, *Alien Breed* and *Superfrog*...

↔ **Allister Brimble**
Freelance musician allied strongly to the early Team 17, Allister composed the music to the three T17 games mentioned above along with many others from not just Team 17's back catalogue, and still works as a video game music composer.

↔ **Tim Wright**
Mentioned here in Amiga Mart more than once in the past, as is Allister, Tim most famously in Amiga circles worked with Psygnosis/Studio Liverpool creating the music for Shadow of The Beast 2 & 3, Lemmings and went on to work on *WipEout*, the MUSIC creation software for PlayStation and more recently *Gravity Crash* on PS3.

↔ **Mike Clarke**
Another Psygnosis musician who composed the music for *Brian The Lion*, *Bill's Tomato game*, *Globdule* and other Amiga titles *Last Ninja 2* and *Indigo*, going on to work on *Formula 1* on Playstation among others.

↔ **Melvut Dinc**
The founder and MD of Vivid Image of *First Samurai*, *Second Samurai* and *Street Racer* fame.

Sven Harvey has been our Amiga specialist for over 15 years drawing on his 24 years retailing computer and video games (25 Christmases, no less) and even longer writing about them.

Amiga

Has The Time Come?

Apple's Watch is here, and Ian McGurren looks at how it has been received

The Apple Watch has been a bit of a strange launch. It's the company's first truly new product of the post-Jobs era, and its announcement was mostly lauded by the tech press. Simultaneously, though, it left many members of the public asking "but what is it for?"

To be fair to Apple, this isn't restricted to the Apple Watch alone, as we seem to be entering a period of 'peak-technology' – we're saturated with the most fantastic devices yet new technology keeps appearing that we are then told is a must-have. In this age of austerity, not everyone is as easily convinced as before. It seems that, in the time between announcement and launch, some of this may have seeped through into the collective conciousness of the tech press. Could some of the reviews maybe not be as evangelistic as expected?

Pretty much all agree on the basics – the Apple Watch is a beautifully designed and manufactured piece of technology. While it is rare Apple would allow anything bearing its name to be anything less than stellar, they have come up with a unique device that's very Apple and very desirable even before being switched on. As if to emphasise this, ASUS' own ZenWatch, revealed after the Apple Watch, bears a notable resemblance. If nothing else, Apple has designed a nice piece of jewellery, especially if you have £13,500 to spare.

The fashion world isn't quite as on board as maybe Apple would hope, though. The brand itself is recognised as having a certain cache, but some have commented that this won't open the doors of fashion the same way as it would for technology. While Apple has worked with watch makers, some fashion journalists haven't been so convinced with the overall look, citing the watch and the various bands' lack of a cohesive design.

Beyond the hardware lies the software, and it's on this that ultimately the reputation of the device – and Apple – stands. To Apple's credit, it hasn't ploughed a similar route as Android's wear UI, instead making use of that mainstay of watch design, the crown, to allow users to scroll without obscuring the screen If you're sausage-fingered, that's quite a bonus. That's not to say you can't operate the device without the crown either, it's just a more elegant alternative.

There's also universal acknowledgement that the Apple Watch is less of a 'second screen' than Android Wear devices are, able to be self-sufficient and operate independently. That's not to say it'll work alone, an iPhone is always required to be tethered, and some apps have to pull their data from the phone, but there are some apps that run on the Watch differently to their iOS counterparts.

Yet, while the UI is recognised as smart and innovative, there's a feeling that the device is either underpowered or that the reliance on another device can drag it down. For example, location based apps have to pull their data from the iPhone, and loading these apps is slow. The transition from one app to another is also occasionally choppy, especially as most only update when opened and not in the background. This is likely in order to save power and will probably be ironed, but for now it feels a little retrograde.

The overall reception for the Apple Watch has been something akin to muted enthusiasm. Those that love the device still struggled to find a reason to spend £300 on one at this time. At the same time, most agreed most of its problems related to it being a version one device, and future versions would become more focused when the consumer starts to understand what it wants from a smartwatch. For now though, like other smartwatches, they still are a solution looking for a problem – it's just Apple's happens to be one of the more interesting solutions right now.

Ian is a professional IT analyst, a semi-professional writer and a pretty amateur electronic musician. He likes gadgetry and loves making gadgets do things they were never designed to do

Router Ruminations Part One

Andrew Unsworth waxes lyrical about routers and the many useful things they can do.

I'd hazard a guess that the number of homes without a modem can be counted on one hand. I'd be completely wrong of course, but I'd hazard it anyway just to point out the ubiquity of something that was once a dream to those that didn't have one and a nightmare for those who did.

I remember reading about an internet service for the ZX Spectrum back in the 1980s, probably in *Your Sinclair*. The service was no more than glorified Teletext, but in those pre-web days it seemed the most exciting thing ever, even more so than the thought of playing *Thundercats* on the Atari ST. Mostly because it was dynamic and you could pretend to be Matthew Broderick in *WarGames*. All you needed to access the service was a modem and to pay a subscription fee that was way beyond my 50p-per-week pocket money.

Back then, modems were simply devices that converted a digital signal to an analogue one and then back to a digital signal in order for one computer to communicate with another over an ordinary phone line. I never had the luxury of using a truly old-school modem, but I've been told by people who have that they were troublesome and took real effort to configure. Get one thing wrong and it could take you hours and a lengthy and expensive call to a manufacturer to find out why the modem isn't connecting to anything. If this sounds familiar to your experience of early modems, we'd love to hear about it on the Letters page.

Thankfully, I first bought a modem in 1999, and I had the luxury of installing it straight into an ISA slot, installing a driver, doing some basic configuration work on screen and then connecting pretty much trouble-free to my ISP.

In these days of ADSL and fibre connections, modems are restricted to the box you connect to your wall, and come housed in a router, a device that acts as a gateway between a set of computers and a wider network and internet. A typical router will have a set of Ethernet connectors to which you can attach PCs by wire, and built-in wi-fi to let devices connect wirelessly, which is the much preferred way of connecting to a network for most people, even if it doesn't provide the fastest data transfer speeds.

However, what many people don't realise is that modern routers for more connecting to the internet. Many let you attach USB drives so that you can use them as network-attached storage (NAS) devices. Many also allow USB printers to be shared with others on a network, which means you don't have to pay hundreds of pounds for a network-enabled model. Over the next few weeks I'll be detailing the many cool things you can do with routers, and how you may even be able to use your existing ISP-supplied router to do them.

Modern routers let you attach storage and printers, as well as control access to the internet

Andrew Unsworth has been writing about technology for several years, he's handy with a spanner, and his handshaking skills are second to none

Ryan Lambie has loved videogames since he first stared up in awe at a *Galaxian* arcade cabinet in his local chip shop. 28 years on, Ryan writes about gaming for Micro Mart. He's still addicted to chips and still useless at *Galaxian*

God In The Machine

Adam Jensen's back, and this time, he has a P.E.P.S. gun hidden in his arm. Eidos says Deus Ex: Mankind Divided will feature twice as many augmentations as its predecessor

This week, Ryan takes a look at the first details for Deus Ex: Mankind Divided, and checks out the revival of 90s space FPS, Descent...

Plug & Play

Adam Jensen's back, and he's brought some new augmentations with him. That's what we learned as Eidos released the first trailer for *Deus Ex: Mankind Divided*. Taking place two years after the events of 2011's acclaimed *Deus Ex: Human Revolution*, *Mankind Divided* sees society hovering on the brink of collapse, as tensions between ordinary humans and those with augmentations reaches breaking point. Against this backdrop, Jensen joins a new branch of Interpol called Task Force 29, his mission: to halt the rise of a terrorist group called the Juggernaut Collective.

At this stage, Eidos is§ probably keen for us to soak up the intense imagery in its announcement trailer (**youtu.be/syywnSpIVok**), which hints at a chaotic near-future of 2029, with a more sophisticated Jensen (he now has a cool-looking Pulsed Energy Projection gun integrated into his arm, for one thing) and a mysterious villain wearing a yellow hoodie. Yet more details are gradually filtering out for *Mankind Divided* from a range of sources – one of them the US magazine, *Game Informer*.

As you might expect, Eidos's sequel will remain true to the spirit of the previous games, with the same strands of social interaction, stealth and full-on combat there to be chosen as the player sees fit. Boss battles will be making a return (something teased at the end of the announcement trailer), but they won't be inescapable as they were in *Human Revolution* – one of the more jarring and most oft-criticised elements of an otherwise superb game. Instead, they'll be more akin to those in *Human Revolution*'s DLC *The Missing Link*, where there are a variety of ways of either avoiding direct confrontation or taking bosses out with a non-lethal blow.

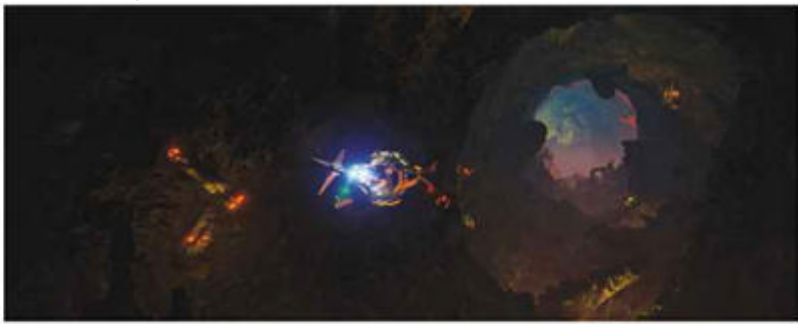
We've also heard about some of Jensen's new augmentations. Some of these include Tesla darts, which Jensen can shoot from his knuckles at enemies and take them down without making a sound, an aug called Silent Run will (as its name implies) allow Jensen to move more stealthily, and then there's the P.E.P.S. gun – revealed in the trailer – which now emerges from Jensen's arm to deliver a satisfying blast of energy. Eidos has said that, all told, there'll be twice as many augmentations in *Mankind Divided* as there were in *Human Revolution*.

What's interesting about Eidos' approach to *Mankind Divided* is that, unlike so many other studios, it seems to be committed to making the *Deus Ex* series a primarily single-player experience. While it's possible that Eidos will add a multiplayer mode to *Mankind Divided* – the studio was reportedly looking for an online programmer to work on the series – its solo campaign is clearly its main focus. Given just how rich the world-building, characters and plots have been in the previous games, Eidos' continued focus on telling a convincing sci-fi story is pleasing to see.

Deus Ex: Mankind Divided's release date is yet to be confirmed, though oddly, Eidos is already taking pre-orders.

Online

Having raised around $78 million and counting, *Star Citizen* is officially the biggest crowdfunding game in history – and remarkably, Cloud



Thanks to the newly founded Descendent Studios, mid-90s space FPS Descent is making a return. Descent: Underground recently passed its Kickstarter goal of $600,000

Imperium, the studio behind the space trading sim, was only originally looking for $500,000 to get it off the ground.

One of the co-founders of Cloud Imperium, Eric Peterson, recently left to set up a new team, Descendent Studios. Its first game is another crowdfunded project – *Descent Underground*, a shiny reboot of the first-person shooter that originally appeared back in the mid-90s. Players may remember that the twist in the original *Descent* was that, rather than trudging around on foot with a gun in your hand, you flew around in nimble, laser-spitting ships negotiating the claustrophobic interiors of mining colonies.

It's now 16 years since the last entry in the *Descent* series, and Descendent Studios is bringing the shooter back for a smoother, 21st century update – and the results look mightily impressive so far. *Descent: Underground* actually began as a game entirely separate from the 90s series (its working title was *Ships That Fight Underground*) but then *Descent*'s original developers, Interplay, got in touch with Descendent to offer them the chance to revive the old space shooting name. In an interview with *Engadget*, Peterson described his response: "Heck, yeah."

Once again, players will plunge into a series of labyrinthine mines in deep space, where taking out a hidden core will again be the key objective. Underground will also provide four kinds of multiplayer combat, ranging from one-on-one skirmishes to co-op modes. In early April, *Descent: Underground* managed to garner the $600,000 it was looking for on Kickstarter, which will fund the game's multiplayer kernel, but Descendent Studios also plans to carry on raising funds through its own website ö if all goes to plan, it hopes to roll out a full single-player campaign and other additions in a series of updates.

With games like *Elite: Dangerous*, *Star Citizen* and the forthcoming *No Man's Sky* handling the more cerebral side of the space flight sim genre, *Descent: Underground* could provide the perfect, arcade-style antidote. Certainly, the variety of the 90s *Descent* games, which mixed shooting with maze exploring, is a concept that has been neglected for far too long. Early signs suggest that *Descent: Underground*'s an affectionate revival of a series rapidly dwindling into history.

You can find out more about *Descent: Underground* at **www.descendentstudios.com**.

Incoming

It's little surprise that Activision has *Call Of Duty: Black Ops III* coming out this year, but the announcement trailer, which appeared on 10th April, caused a clamour of excitement in any case. The trailer itself appeared to give away relatively little – just a swirl of letters and numbers, followed by the ominously large *Block Ops III* logo. Since then, we've learned that the sequel will be set in the future, but there are also suggestions that part of its plot will also take place in the 1980s. Some eagle-eyed web dwellers also noticed that some apparently random numbers in the trailer were actually map coordinates, which when put into Google would seem to suggest that we'll be revisiting familiar locations in Singapore and Egypt – places last seen in *Black Ops II*.

A hidden marketing blurb was also discovered, tucked away in the code of the official *Call Of Duty* website. The most interesting bit of that blurb? It not only talks about "a dark, twisted future where a new breed of Black Ops soldiers emerges" and "military robotics," but also reveals that, yes, the zombies mode will be returning. Again, none of this information is too much of a surprise, but it's worth noting that the *Call Of Duty* series seems to be drifting further into *Deus Ex*-style sci-fi with each passing instalment.

We'll know for sure what it all means when *Call Of Duty: Black Ops III* emerges in the autumn.

▲ *Yes, Black Ops III will be this year's Call Of Duty instalment. Treyarch's currently developing the sequel, which will be "the deepest and most ambitious" game in the series so far, it says*

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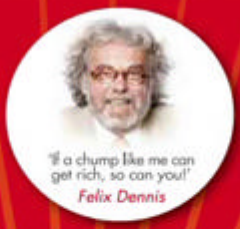

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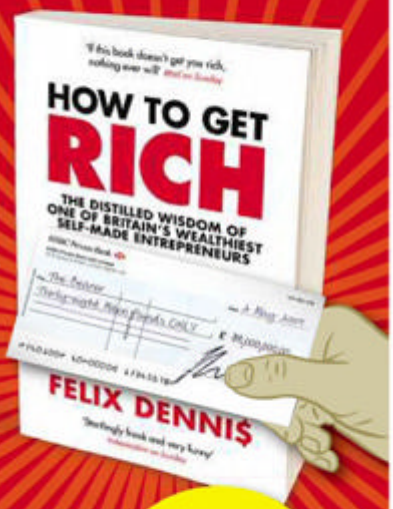

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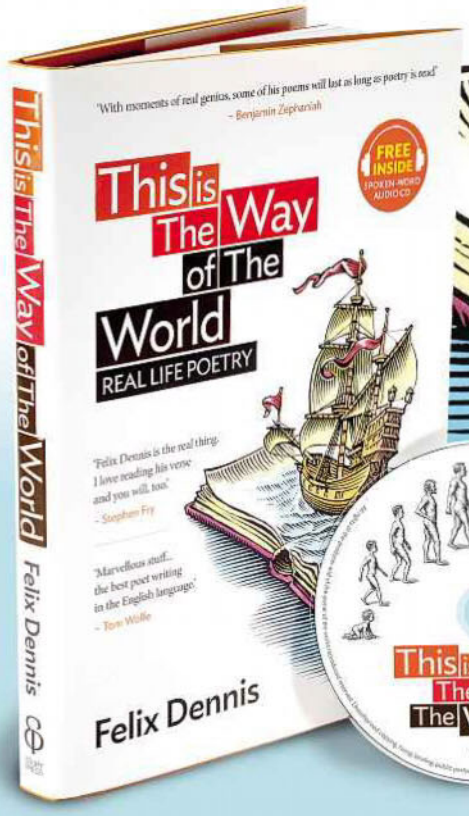

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Tel: (07817) 861011
Email: Johnhaviland73@gmail.com

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Please try to keep your queries brief and limit them to just one question per letter, simply so we can squeeze in as many as we can each week. Please include relevant technical information too.

Aaron

64-bit Upgrade

I have a system that's now a bit long in the tooth. It is a Pentium dual-core E6500 2.93GHz,with 4GB RAM and two 500GB SATA hard drives. Currently it is running Windows 7 Home Premium 32-bit SP1.

I have a retail version with both 32 and 64-bit DVDs and I now intend to reinstall using the 64-bit version as I intend to add more RAM to the system. The 32-bit version installed only reports 3GB for use.

Will I now have to do a fresh install and lose all my other files, or can I install the 64-bit version of Windows 7 as an upgrade?

Tom

Unfortunately, there's no way to upgrade from 32 to 64-bit versions of Windows 7 without performing a full installation of the operating system, and if you're going to make the switch, you'll need to go the whole hog, I'm afraid. There are no shortcuts to this, sorry I can't offer you a magic fix.

So, before you begin you should look into backing up all of your data to another partition or HDD volume, and ensure you have the installation files for your programs. Then, you'll need to run the install for the 64-bit version of Windows 7 from the disc, formatting the existing partition or drives before installing the new OS.

Mini Linux

I'm interested in buying one of the cheap Atom-based mini PCs that are appearing on the market at the moment. However, that's only if it's possible for me to install openSUSE on it.

I've heard there are a few problems around UEFI and Linux on such devices. Could you shed some light on this? I quite fancy the Voyo mini PC, which has more storage than most.

David

Mini PCs are appearing more and more, with some interesting models. However, many have found problems with Linux, mainly due to the firmware, and, as you've said, problems with UEFI BIOS versions. It's difficult to say for certain if Linux will work on these devices, however there are some that are designed with Linux in mind.

*For example, if you visit the online retailer, CloudSto Electronics (**www.cloudsto.com**), you'll find a selection of mini PCs that have no problem running Linux. These come in various shapes and sizes, all tiny, and perfect for those who simply need a low power, no frills PC.*

*The Voyo Mini PC is, indeed, one of the most powerful options around, and the 64GB of space, 2GB RAM, and the quad-core Atom Z3735F makes it a very tantalising prospect, but it's mainly designed for Windows use (it even has Windows 8.1 embossed on the case), and the UEFI attests to this. Users have found it possible to run Linux on such devices, though, by modifying Linux to boot from UEFI. OpenSUSE should theoretically be able to run on this kind of setup too, and you can find help on the OpenSUSE website at **bit.ly/1yn5edT**. Just be aware that this can be a complex procedure, and you'll need to pay close attention to the instructions and guidance provided. If you're not too sure, it may be best to stick with a mini PC you know is capable of running Linux without any tinkering.*

< The Voyo mini PC is a great little

Offline SP1

I've got six versions of Windows 7, all purchased before SP1 came out. As the computers they are installed on need rebuilding, I've been loading them up on the new ones and spending a couple of days downloading updates, including SP1. However, when Microsoft stops supporting Windows 7, how will I be able to get the SP1 updates? I've never seen it available on a disc. Could you tell me what my options are once

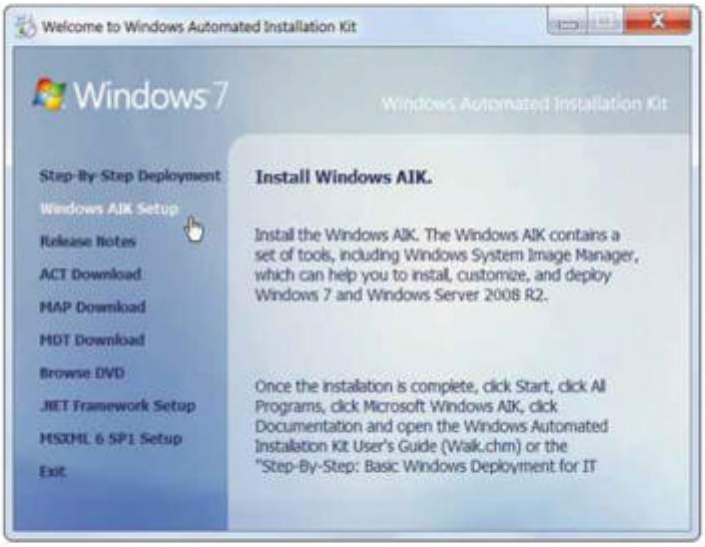
MS support stops? If you could do that without using the words Windows 10, I'd appreciate it.

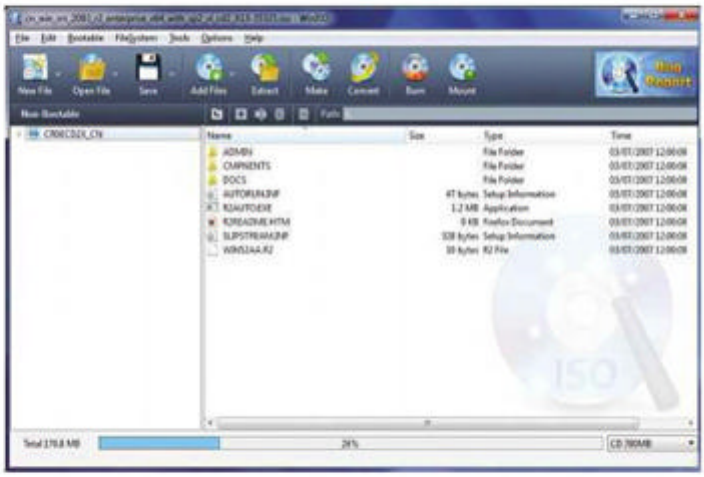
David

*The best solution here would be to simply download an offline copy of SP1 for Windows 7, which you can get from Microsoft (**bit.ly/1cm0AAN**). These files are downloaded in either ISO or MSI format. Be sure to check out the whole page, as it'll give you plenty of information about the download and how to use it. Once you have this, you'll have a local copy of the OS with SP1, so won't have to worry about any stoppage of support in future, even if Microsoft withdraws official support.*

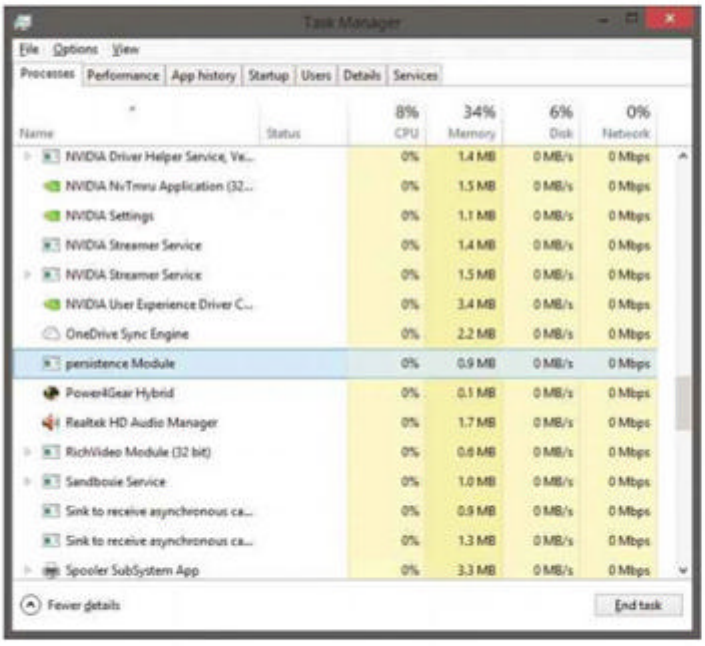
*Alternatively, you can also create your own install disc by creating a bootable Windows 7 ISO. To do this you'll need some software, such as WinISO (**www.winiso.com**). This is a special tool that can be used to create custom install discs. There are other tools that are specially geared towards custom Windows installations, including 'slipstreamed' installs that include updates. This includes Microsoft's own Automated Installation Kit (**bit.ly/1l1GlHL**), which can create these custom discs, and the more user-friendly tool, RT Se7ven Lite (**www.rt7lite.com**). Either of these can be used to create a slipstreamed install disc, complete with SP1 and any other updates. You'll need to run them on a machine that has Windows 7 installed, and you'll need access to the source install, such as an ISO or original disc.*

Once you run these, and follow the instructions, you'll end up with a special Windows 7 install disc that'll install the OS, along with the service pack and any other updates. You can even customise the install further, with an option to create an unattended install, which will fully install Windows without you having to be present to manually select options. This is widely used in corporate environments where technical support staff can't sit around installing Windows manually on all machines. Instead, these can be set going and left alone to finish.





➤ ***WinISO is a free tool that can create bootable ISO images, including Windows installs***



Persistence Is Futile

I noticed a strange entry in my Task Manager processes in Windows 8, and I'm not sure what it is, if it's supposed to be there, and if I should do anything about it. It's called 'persistence Module', and it appears to be set to load up with my PC.

Is this something I should worry about, or is it just a normal part of my system?

Will

The persistence Module is a process used by Intel graphics hardware, so there's no need to worry about it being on your PC. However, it's also been known for the software to interfere with other graphics drivers, including colour correction, so if you use another graphics card, and not the internal hardware, you may want to disable the process, and stop it running during startup. It won't cause any problems, and even if you do use the Intel hardware, everything will still work.

➤ ***Persistance Module is a safe process, and is used by Intel hardware, so don't panic if you see it running on your PC***

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Jason

Down To Earth

The office block where I rent my office provides 80Mbps fibre broadband. However, the router is in a cupboard on the ground floor and I'm on the first floor. Understandably, the wi-fi signal is poor, so it's been suggested I should try HomePlug. If I understand things correctly, I'd need one adaptor plugged into the router and a nearby wall socket and a second adaptor plugged into a wall socket in my office. I'd then be able to access the Internet through the mains wiring. Would this work? Would it be fast enough?

Greg, Gmail

There are two current HomePlug flavours: AV and AV2. AV has existed for nearly a decade, and the advertised speed is 200Mbps. But you can ignore that, Greg – the advertised speeds are mere marketing gambits. In the real world, 200Mbps adaptors get you about 40Mbps, and even adaptors touting unofficial 500Mbps and 1000Mbps speeds push this only to about 50Mbps. Adequate, perhaps, but with fibre broadband now so common, and with 76Mbps or 80Mbps the typical entry-point, HomePlug AV is looking tired.

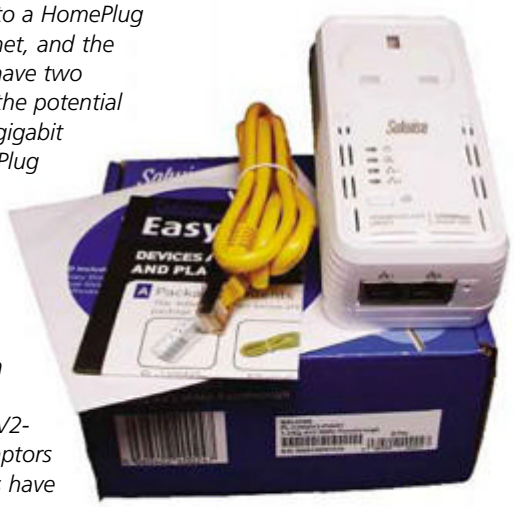
Recently hitting the market, then, is HomePlug AV2. This uses not only the live and neutral wires of the mains circuit but also the ground or earth. The base advertised speed is 600Mbps, but the adaptors to buy are those utilising MIMO – multiple-input, multiple output. Essentially, these transmit two signals simultaneously, joining them up at the end. Look for an advertised speed of 1200Mbps.

The adaptor I'm most familiar with is the Solwise PL-1200AV2-PIGGY. You're right: you need at least two. A pair can be bagged for under £80 – pretty good value, I reckon. And, man, they go like shale off a shovel. In the installation I oversaw recently – one room to another, on different floors – I got 110Mbps. Impressive. To be fair, all 1200Mbps adaptors use the same chipset – the Atheros AR7500 – so performance should be much the same regardless of model or brand.

Devices hook into a HomePlug network via Ethernet, and the Solwise adaptors have two ports. Because of the potential speeds, these are gigabit jobs (1000Mbps). Plug a switch into one of these if you need more ports. A five-port, gigabit affair should cost no more than £10 – a lot cheaper than a crate of PL-1200AV2-PIGGYs. Some adaptors from other makers have three ports, and some only have one. Buying an AV2 adaptor with built-in wi-fi is another option, but prices are steep.

All in all, a HomePlug setup would seem to solve your problem, Greg. But there are a few caveats. First, the router might only have 100Mbps Ethernet ports, so some of AV2's performance – just a little – could be choked off at source. Second, performance depends on the quality of the mains wiring, distance, and whether any noisy appliances are on the circuit. Also bear in mind that HomePlug signals can't hop over consumer units (fuse boxes), so if the office with the router and your own office are separated in this way, I'm afraid you're stuffed.

Can HomePlug AV2 adaptors really deliver a bandwidth of 1200Mbps?



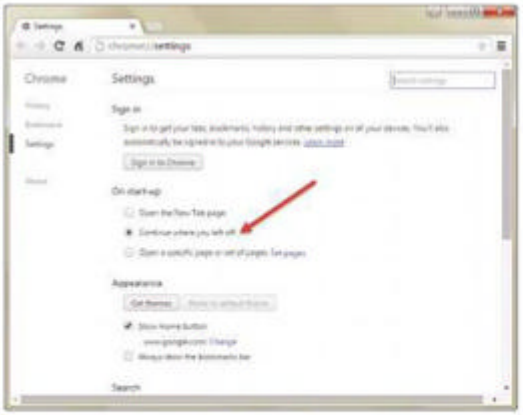
Making History

In the work I do I often have a couple of dozen browser tabs open in Chrome. When I switch on my laptop each day, I have to start from scratch, re-opening the tabs. Most of the sites I visit don't change from day to day, so it would be useful to have them open automatically when Chrome starts. I'm sure this is possible – I've read it somewhere – but I can't find anything relevant in the settings. Can you help?

L Morley, Gmail

You'll kick yourself, my friend. I've no doubt you've seen the required option already and walked right past it. Click the settings icon (the one with three horizontal, parallel lines), click Settings, and find the 'On start-up' section. To have Chrome always fire up all the tabs from your previous session, just select 'Continue where you left off'. Try not to hurt yourself too much with those size elevens, eh?

Want Chrome to remember which tabs you had open? Done!



Cable Guy

I've just changed my ageing BlackBerry Bold 9900 smartphone to a BlackBerry Q10. I love it, and I'd like to use the Micro HDMI port to connect it to my TV. Do I need an official BlackBerry cable or will any cable do? What about the £1 ones from the pound shops? Do they actually work?

Simon Johnston, Outlook.com

You don't need an 'official' cable, Simon, and the £1 cables work fine – no different to ones costing fifty times as much. A digital signal is either transmitted or it isn't, and any corruption is obvious – blocky artefacts, stuttering sound, dropped frames. Cheap cables do tend to come in short lengths, though. The pound-shop variety are usually 1m. Such is the quality of the wire materials, anything longer and you'd see less corruption from a third-world dictatorship.

The connectors often don't stand up to much abuse, either. For example, if you plug and unplug the cable a lot, you might find after a few months that they become weakened – perhaps the solder joints break – and the cable could simply stop working. But for £1 (even less in some shops), who's complaining?

➤ Do HDMI cables from pound shops actually work?

On The Slide

I need to take the plunge and buy a new PC (nothing fancy). My current one runs Windows XP, which everyone tells me isn't safe any more, especially online. In the last few weeks, too, I've been getting lots of random shutdowns. It's time to move on.

Nearly all new PCs come with Windows 8.1, and even though this seems widely hated, I'd like to get to grips with it. However, I'm concerned about my Canon Pixma MG3150 printer and Epson Expression 1680 Professional scanner. Will these work? The scanner in particular is vital, as I use it for archiving slides for a local historical society. It cost £850 when new and buying a replacement really isn't an option.

Gareth, Hampshire

You're good to go with the Pixma MG3150, Gareth. Windows 8.1 is fully supported (both 32-bit and 64-bit). If you need the drivers, they're here: ***goo.gl/CAUFuQ****.*

As for the Expression 1680 Professional – wow. It's knocking on a bit, isn't it? It was launched in 2001, and at first I feared it might be a SCSI unit, and indeed it is. Thankfully, though, there's also a USB port. For the drivers, see ***goo.gl/4AnMM2****. Amazingly, support goes right up to Windows 7 (both 32-bit and 64-bit), but it's no great surprise that Windows 8.1 is left out in the cold. I guess manufacturers can only be expected to support products for so long. Sooner or later, they're going to want users to dip into their pockets again.*

Now, it's possible the scanner might be coaxed into service – a basic service – via the drivers Windows 8.1 already has built in. I'm not optimistic, however. It's also possible you could use the Windows 7 driver, perhaps via compatibility mode. See here for instructions on doing that: ***goo.gl/GBehqs****. Again, I'm not optimistic. Another option is to install Windows 7 in a virtual machine – Windows 8.1 would treat it somewhat like an application – and use the scanner there. For a detailed guide on doing that, take a look at* ***goo.gl/SfwXbe****.*

If the above looks like a lot of hassle or too much of a gamble, you're best to stick with Windows 7. It's still got years of life in it – support doesn't end till 2020.

As you suggest, though, Gareth, finding Windows 7 on an inexpensive PC is getting hard. One nice example is the Lenovo ThinkCentre E73 (model 10DR000TUK). This is a Windows 8 Pro tower that's been officially pre-downgraded to Windows 7 Professional (this can be reversed if required). Laptops Direct has it for a hair under £240 (including a £30 cash-back): ***goo.gl/udnuqy****. Pretty sweet for a branded Core i3 rig.*

➤ It's not always possible to get old peripherals to work with new OSes (an Imperial 66 is what I learned to type on!)

Crowdfunding Corner

This week, we've got a pair of smart devices designed to give you smart-alternatives in your life at a low price

Noteu

A lot of people have abandoned a traditional alarm clock in favour of a smartphone by their bedside. So why fight the trend when you can opt for this 'smart' alarm clock that essentially does everything your phone does, but without the need for constant charging and the possibility that you'll leave it in your coat pocket when you need it to wake you up in the morning?

The Noteu is wi-fi-connected, as you'd expect, and – besides waking you from your slumber or simply informing you as to the time – can be used to convey notifications from Facebook, Twitter, Email and RSS, meaning that you can see what's going on in the world as soon as you wake up. A capacitive LCD display gives you instant access to its various features, and the microUSB port makes it easy to charge from a variety of sources. Software widgets and IFTTT integration mean you can set up more complicated behaviour. Want to get an early start if the weather's nice? IFTTT and the Noteu can ensure your alarm goes off if the forecast is good, or give you a lie-in if it isn't. Integration with iOS and Android is a given, and the Noteu has its own cloud servers with oAuth security to ensure that your information is always safe.

The standard device, in white or blue, is £74 if you catch the early-bird tier (not bad for what is essentially a tablet) and £89 at full-price – and for £99 you can get a version engraved with the text of your choice. It's slowly edging towards a fairly modest target of £10,000, so it's worth getting in on the project early to make sure it happens!

URL: kck.st/1FQwn8s
Funding Ends: Wednesday, May 6th 2015

Appkettle

A smart alarm clock is one thing, but it doesn't make sure there's a cup of tea waiting for you first thing every morning. Luckily, the Appkettle can fill that void.

Like other smart kettles you may have seen, the Appkettle has a temperature readout which can be picked up by your phone and an app that allows you to run it to built-in timing. Unlike other smart kettles, the Appkettle also has a volume sensor and energy monitor to help you keep track of your kettle's performance and power consumption. Connected to your phone or tablet over wi-fi, it can be controlled by multiple users and has a real-time feedback interface so that you check exactly how things are going without having to leave your chair. Specific features include custom temperature boiling, regular schedules, user presets and baby-related features to make preparing formula easier and faster.

If you like the idea, you can pick one of these kettles up for £89 (it's a UK invention, naturally) which is £30 off the suggested retail price of £120. It's about a third towards its target with a third of the time gone, so there's every chance it could be a tight-run race, but if you want a smart kettle this is your chance to get one as part of a unique project.

URL: kck.st/1NBgdSg
Funding Ends: Tuesday, May 5th 2015

Disclaimer: Images shown may be prototypes and Micro Mart does not formally endorse or guarantee any of the projects listed. Back them at your own risk!

App Of The Week

Stellarium Mobile Sky Map

David Hayward casts his gaze towards the heavens this week

It's a pity that the best times to view the stars is in the middle of winter, because standing outside with numb fingers while locating Saturn amid the noise of chattering teeth is something we'd rather not have to do.

Still, we look upon the glory of the local universe because we're constantly amazed by its wonders, regardless of the weather conditions.

Now, though, the weather is warming up – slightly. Unfortunately, it's not quite as dark as it was a few months earlier. That doesn't stop us, though, and you can be sure that on a clear night without a hint of atmospheric disturbance, we'll be in the back garden or down the beach with our telescopes and other viewing apparatus.

This, then, is an ideal time to dust off the astronomy apps on your phone. Many purists will balk at the idea of using a phone, with GPS, to locate objects in the heavens. Thankfully, though, we're not purists, and we're quite happy to embrace what advantages technology offers us when we're slowly building acute neck pain while looking upwards.

"My God, It's Full Of Stars..."

Google Sky Maps is generally a good app for locating stars, but it's not very accurate on every mobile platform it's installed on. The alternative is something that's far more professional, complete and already has a long history of helping amateur and professional astronomers alike: Stellarium.

Stellarium has offered the desktop astronomer a glimpse of the stars for many years and when connected to a GoTo telescope, the amateur star gazer can balance a laptop on their knees while getting some pretty spectacular results from their kit.

And now Noctua Software has brought us the Stellarium Mobile Sky Map, an app that brings all that fully featured desktop planetarium goodness to the touch of your fingers when out and about.

It features a catalogue of over 600,000 objects, including galaxies, nebulae, planets and even satellite data – together with information on the current location of the International Space Station. It uses your current whereabouts, time and date and displays the most relevant information, such as light pollution levels and current atmospheric refraction.

As you would expect, along with the many thousands of objects in its database, you'll also be able to get up-to-date information on nigh-on all of the stars present in the night sky, including a realistic simulation model of the Milky Way, all in glorious 3D and high resolution.

> **"The high-definition graphics look amazing"**

Conclusion

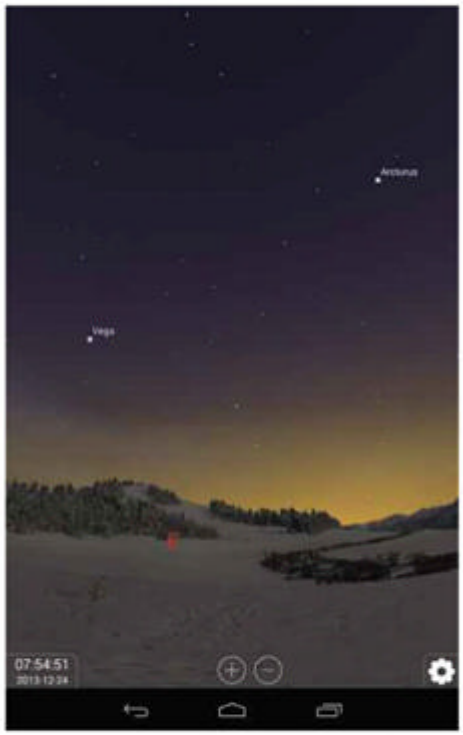
If you're an avid star gazer or you simply enjoy looking up while taking the bin out at night, the Stellarium Mobile Sky Map is one to install on your phone.

It costs just £1.56, which isn't much really. And it works wonderfully on a phone with a big screen (we installed it on a Galaxy Note 4), where the high-definition graphics look amazing.

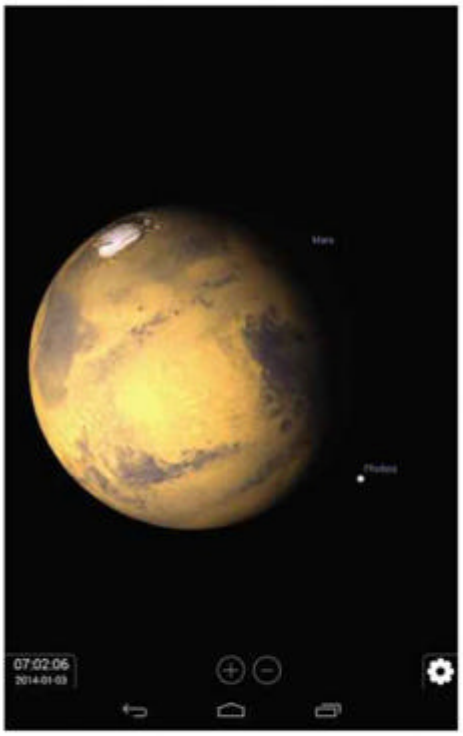
Now all we need is for technology to catch up and those clever engineers to make a more mobile high power telescope and phone all-in-one device. That would be something pretty amazing – a scope in your pocket. **mm**

Features At A Glance

- 600,000 plus star catalogue.
- Accurate GPS night sky.
- Tons of information on nearly every object.
- Special night mode.



With your mobile in hand, Stellarium will locate your whereabouts and set the time and date



There are some marvellous images to view

Logging Off

I've written before about mobile phone update and how the user seems to get short changed between the hardware makers and the phone networks. But this week I'm going to offer up a little sympathy for phone makers, or at least those who want to deliver the latest Android 5.0 experience, Lollipop.

In short, there appears to be lots wrong with this release, and Google doesn't seem to be moving forward in addressing all those issues as fast as it could.

That would be fine if when it launched lots of phone makers committed to get this release on their hardware 'soon', and now have irate customers demanding to know where their update is!

When this story first started to develop, I was one of those users, wondering why Motorola was sitting on the update for my Moto G LTE, while releasing it in the USA, Brazil and India, curiously.

But then they did release it for my old Moto G, which my daughter now has, and it caused her all manner of problems. The major one was the wi-fi didn't connect reliably, causing her to use up her month's 3G data quota in just a few days.

That's not helpful, and combine with my own experience with the Nexus 10, currently at Android 5.1 after three updates, it seems that Google isn't fully in control of this situation.

However, what compassion I have for Motorola, caught in this crossfire is somewhat tempered by a number of things it chose to do that have actually made its situation worse.

The first of these was a highly inadvisable promotional piece it did on its own official blog, where it boasted that it had got the first Android upgrade to Lollipop out in just eight days. That beat its previous record for KitKat, which took 19 days to deliver. It's also worth pointing out that the upgrade was just for Moto X (2nd Gen.) Pure Edition in the USA, so it was a very limited release.

The trouble is it sounded that horn in January, and most Motorola phone owners still haven't seen an update. It also seems gloriously unaware of how stoking expectations and then not meeting them has very obvious negative consequences.

Astutely for Motorola, it doesn't allow comments on its blog postings, because the grief it bought itself on Twitter and Reddit was stunning.

This also resulted in those Motorola representatives sent to calm the masses from getting very annoyed with their customers, forgetting

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that they were only upset because of promises Motorola had made/inferred and not delivered.

From this writer's perspective there are plenty of lessons to learn here. Not least that if the marketing department wishes to showboat with something that software engineering is still wrestling with, then they do so at their own peril.

As for Motorola customers, they're left with a generally sour taste in their mouths, and the support page that tells you pretty much nothing about when your Lollipop will become available, other than it will be available at some point. Maybe.

Google needs to fully fix Lollipop pronto, put some pressure on phone makers to retrograde it to older phones and try communicating too. The customers need to chill so they get an upgrade they'll actually want, and Motorola should accept some blame for irritating its users.

Mark Pickavance

LAST WEEK'S CROSSWORD

Across: **1** Beam, **3** Audacity, **9** Reagent, **10** Coder, **11** Skinnymalink, **13** August, **15** Frisch, **17** Marx Brothers, **20** Kazoo, **21** Neozoic, **22** Pegasoid, **23** Skol.
Down: **1** Barnstar, **2** Atari, **4** Uptime, **5** Acceleration, **6** Indents, **7** Yard, **8** Peano's axioms, **12** Physical, **14** Gdanzig, **16** Brunei, **18** E-book, **19** UKIP.

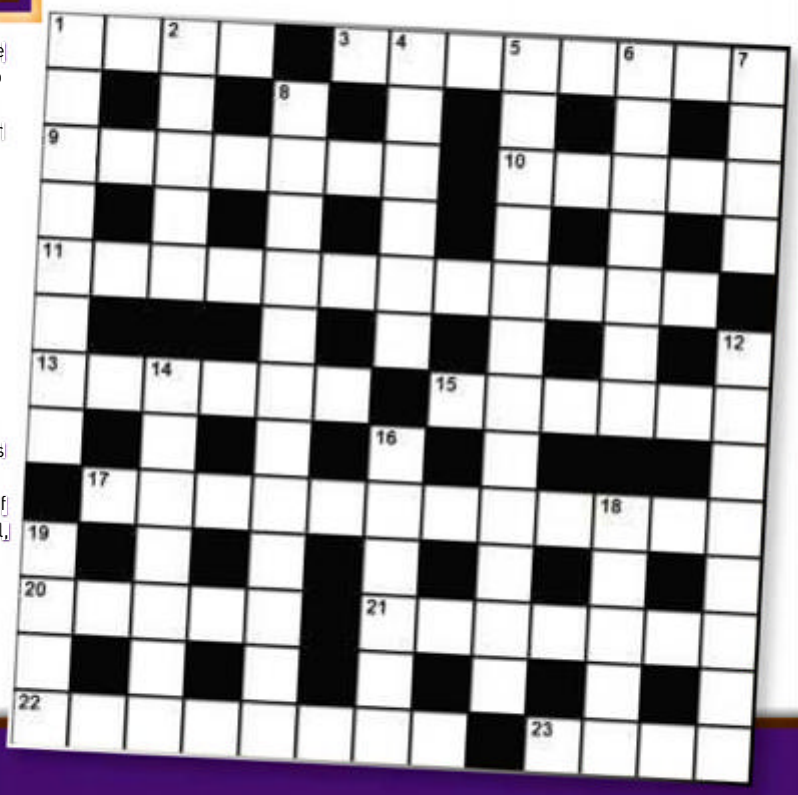
THIS WEEK'S CROSSWORD

Across

1 The angle between the direction a gun is aimed in and the position of a moving target. (4)
3 The quality or character given to a sound recording by the space in which the sound occurs. (8)
9 Given instruction on a one-to-one basis by a private teacher. (7)
10 A programmable digital counter that either increments or decrements at a fixed frequency. (5)
11 Psychosomatic illness caused by working with computer technology on a daily basis. (12)
13 Refuse to take ownership or acknowledge someone or something. (6)
15 Discolouration of the subjects' eyes in an image caused by the camera flash. (6)
17 Where the National Archive places a scanned document or photographic image for safekeeping. (7,5)
20 Revealing lack of perceptiveness, judgment or finesse. (5)
21 The raft made of balsa logs in which Thor Heyerdahl sailed from the western coast of Peru to the islands of Polynesia in 1947. (3-4)
22 A wilful disobedience to or disrespect for the authority of a court or legislative body. (8)
23 A mistake in printed matter resulting from mechanical failure, but more likely to be finger trouble. (4)

Down

1 The angular distance between an imaginary line around a heavenly body parallel to its equator and the equator itself. (8)
2 Leading manufacturer of computer power supplies. (5)
4 A woman transformed into a Gorgon by Athena; she was slain by Perseus. (6)
5 The process of dividing memory or processing power between a number of tasks by allocating segments of it to each task in turn. (12)
6 Indian greeting gesture consisting of a small bow while holding the palms together raised before the body. (7)
7 Relating to Europe or the European Union. (4)
8 English aeronautical engineer, test pilot and inventor of the jet aircraft engine. He took out the first patent for a turbojet engine in 1930. (5,7)
12 Subatomic particle with a mass close to zero and half-integral spin, which rarely reacts with normal matter. (8)
14 Take eager advantage of something or some idea. (5,2)



DISCLAIMER
The views expressed by contributors are not necessarily those of the publishers. Every care is taken to ensure that the contents of the magazine are accurate but the publishers cannot accept responsibility for errors. While reasonable care is taken when accepting advertisements, the publishers cannot accept any responsibility for any resulting unsatisfactory transactions. We love the Raspberry Pi, and this week, two more Micro Mart team members joined the mini-PC revolution. And just like we love this Pi, we're also rather fond of actual pie. But while we've struggling with the former, we've had little trouble with the latter, and it's beginning to show. To burn off some of our surfeit of body fat, we've taken to using an exercise bike while watching the telly. So far, the TV watching is going well, but the less said about our abortive attempts at exercising, the better. It got us thinking, though, we could hook up the Raspberry Pi to the bike and create some sort of game, to motivate us to push hard. Unfortunately, apart from our hatred of physical exercise, there's one huge problem: we have no idea how it would actually work. So if any coding wizards would like to create this for us, then we'd be very grateful, and we'd give you all of our secret chocolate stash. Well, some of it anway, which we're sure you'll agree is a start at least. Not a particularly good one, but a start all the same. Anyway, time for a nap...

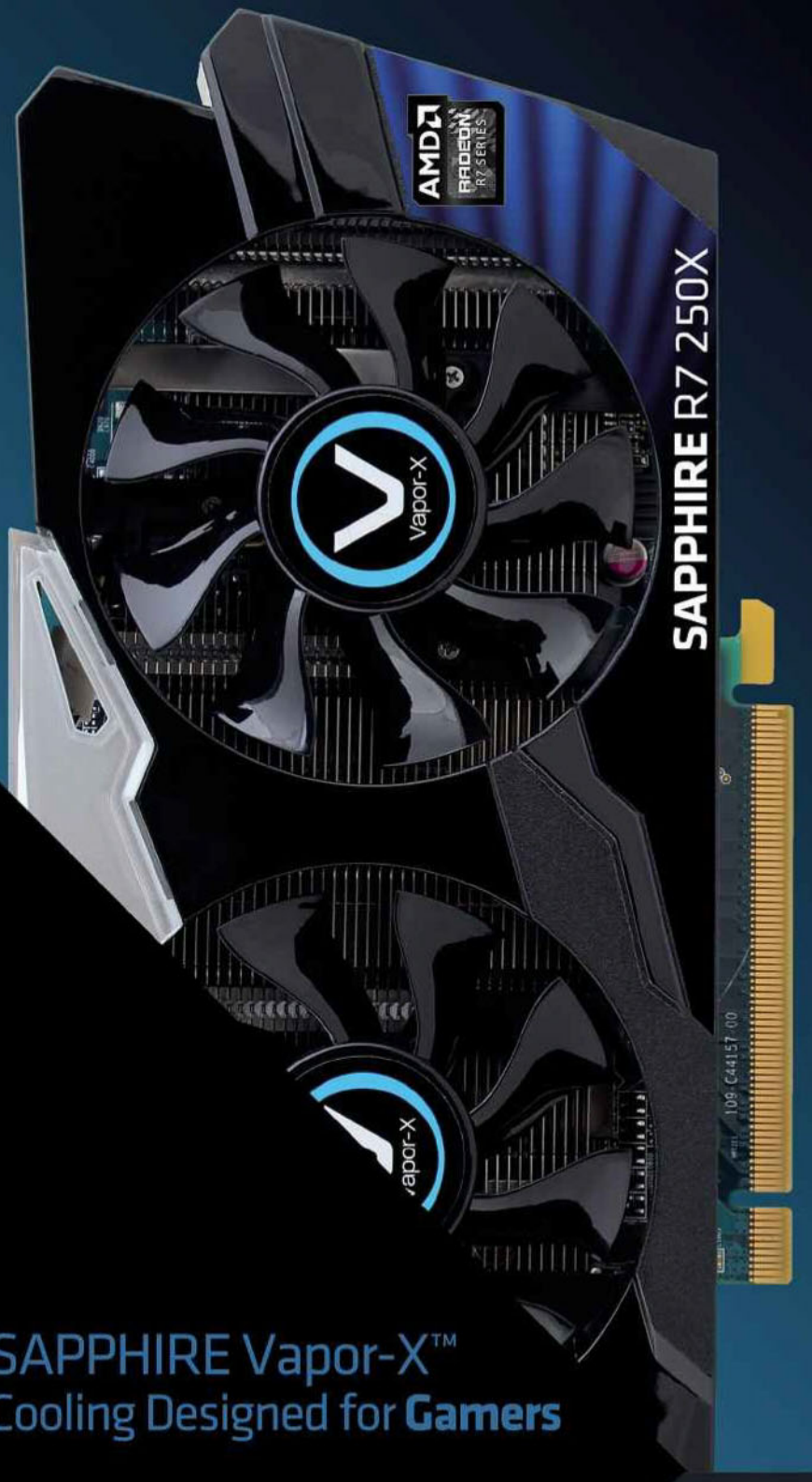
In Next Week's Micro Mart*

- What hardware and devices is Microsoft planning to release next?
- Which watercooling solution is the right one for you?
- How mobile devices could be changing the face of the web
- What's all the fuss about USB-C?
- Plus the usual mix of news, reviews and advice

* May be subject to change

Gaming Starts Here

Vapor-X



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